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ABSTRACT

The assumptions and practices underpinning the pedagogy of online delivery of vocational education and training (VET) in Australia were examined. Data were collected through a literature review, workshops at three participating technical and further education institutes, and a survey that elicited response from 200 teachers and 110 students. Selected findings were as follows: (1) pedagogical practice in Australia's online learning environment rarely conforms to the 15 principles of pedagogical effectiveness identified by stakeholders in online delivery of VET; (2) teachers are holding firmly to sound principles of pedagogy, and students are reiterating the importance of those principles; and (3) interactivity is unequivocally regarded as the most effective teacher-student relationship to develop in online learning environments. The study established that online pedagogy in VET needs to be able to create teaching and learning environments where students have the opportunity to do the following things: reduce their reliance on text; explore and value their intellectual, social, and cultural backgrounds; develop their knowledge beyond the transmission and assessment of content; reflect on their own learning; be part of an inclusive learning environment; communicate extensively with their peers and teachers; become self-regulated and engaged with their own learning; and develop a group identity that connects them with their learning and with the broader social environment. (Volume 1 contains 48 references. Volume 2 contains interview results, survey results, analysis of the online course filter, results of applying the productive pedagogies framework, and the survey questionnaire.)

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One size doesn't fit all

Pedagogy in the online environment – Volume 1

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One size doesn't fit all

Pedagogy in the online environment – Volume 1

Roslin Brennan

Australian *Flexible* Learning Framework
Supporting Flexible Learning Opportunities

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Publisher's note

This report is published in two volumes: volume 1 contains the main report, while volume 2 contains the appendices. Volume 2 can be found on NCVER's website <www.ncver.edu.au>.

Background

In August 1999, the Australian National Training Authority chief executive officers endorsed the *Australian Flexible Learning Framework for the National Vocational Education and Training System 2000–2004*. The Australian Flexible Learning Framework has been developed by the Flexible Learning Advisory Group and represents a strategic plan for the five-year national project allocation for flexible learning. It is designed to support both accelerated take-up of flexible learning modes and to position Australian vocational education and training as a world leader in applying new technologies to vocational education products and services.

An initiative of the Australian Flexible Learning Framework for the National Vocational Education and Training System 2000–2004

Managed by the Flexible Learning Advisory Group on behalf of the Commonwealth, all states and territories in conjunction with ANTA.

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Executive summary

Introduction

Vocational education and training (VET) in Australia is increasingly being delivered online. Computer-based technology is supporting and replacing face-to-face training. As this trend continues at an extraordinary pace, questions on the effectiveness of this current practice need to be addressed. This project considers the factors that contribute to sound pedagogy and draws attention to those that require more research.

'Pedagogy' may be defined as the 'art' of teaching and learning. As such, teaching and learning practices influence the design and the delivery of teaching. The small amount of literature on online pedagogy is concerned with the mechanics of design, the process of implementation and an increasing number of evaluations of student outcomes and staff participation, rather than with what makes a quality learning experience.

The teacher's role is critical in the online environment and extensive lists of the skills and attributes of the ideal teacher have been developed. These include technical, facilitation and management skills that need to be combined in particular ways to suit the student, the content and the medium.

Student learning styles and preferences are important determinants in judging the effectiveness of online pedagogy. The content of the material, the structure of the curriculum and the institutional and policy constraints in VET also influence the pedagogy and its effectiveness. Assertions of the medium's capabilities are impressive. Online learning is said to encourage active engagement, facilitate easy access, speed up communication between teacher and learner, provide useful learner choices and create learning environments where learners are able to construct knowledge for themselves as they learn. These capacities undoubtedly exist, but the scope of their effectiveness, take-up rates and the ability of teachers to develop adequate practices to match the capacities is relatively untested.

Online delivery of VET is populated with teachers and learners with very different abilities and predispositions, all operating within the design limitations of course materials. Learners are clear about their expectations. They want a pedagogy predicated on contact, communication, feedback and flexibility. Teachers want the ability to communicate and interact with their students. However, current online delivery imposes assumptions on both teachers and learners that often militate against the realisation of these expectations.

Purpose of the study

The purpose of this study is to examine and make explicit the assumptions and practices which underpin the pedagogy of online delivery of VET.

The objectives of this research project were to:

- examine a range of current online pedagogical practices in VET and how these intersect with student learning styles and preferences

- ✧ generate a set of 'pedagogical effectiveness indicators' (PEIs) based on these practices and apply them to a range of current course offerings
- ✧ provide a robust body of knowledge in accessible formats which teachers/trainers can use to inform the methods of delivery that they use in VET to maximise the match between student needs and the technology available
- ✧ provide an extensive body of knowledge to be disseminated in a variety of formats which policy-makers can use when deciding on the extent and types of technology to fund, and the kinds of staff and student support necessary to ensure that the investment in technology is maximised.

Methodology

Data from interviews, workshops, focus groups and questionnaires to learners and teachers have been collected from a wide variety of sources in a number of key locations across Australia. Teachers, students, educational designers, policy makers and managers have been involved.

Findings

The key messages emerging from the study are as follows:

- ✧ There are a number of principles of pedagogical effectiveness that are clearly expressed by all stakeholders involved in the online delivery of VET. These are:
  - a learner-centred environment
  - constructivist approaches to teaching and learning (approaches enabling learners to build new knowledge and skill based on what they already have)
  - high quality materials design
  - teaching and learning strategies that develop cognitive skills
  - high levels of interactivity between all participants
  - guaranteed and reliable forms of access to the technology
  - quick and easy access to the training site and the online technology
  - engagement with the online materials
  - learning experiences that encourage synthesis and analysis
  - opportunities for 'deep learning'
  - consistent levels of feedback
  - thoughtful matches between materials, learning styles and learning contexts
  - a model of delivery that includes thorough planning, monitoring, reviewing and evaluating course materials and student progress
  - a range of available navigational choices for students
  - teachers who are imaginative, flexible, technologically gymnastic, committed, responsible and expert communicators.
- ✧ Pedagogical practice rarely conforms to these principles. The dominating influence of the technology has created assumptions about the nature of learning, the role of the teacher and the student characteristics, and these are poorly matched with teacher and learner expectations.
- ✧ Teachers are holding firmly to sound principles of pedagogy and students are reiterating the importance of these. Communication, interactivity and the development of social cohesion are regarded as laudable goals in an environment that frequently mitigates against their achievement. A large number of teachers are not only struggling with the demands of rapidly changing technologies, but also with an often unfriendly teaching context that is pre-determined by institutional structures and management practices, course content, material presentation and the nature of the platform that their institution is tied to. It is a credit to teacher/trainer professionalism and dogged persistence that online delivery works as well as it does.
- ✧ The casualisation of the VET teaching workforce may affect the effectiveness of the implementation of online and other flexible approaches. Staff also reported having little time for reflection on their

practice. The changing roles of teachers and the way of working both need to be recognised and respected at the institutional level and supported by appropriate professional development.

- There was general consensus that 'suitability' for online delivery is a relative judgement. Online delivery certainly offers learners flexibility and access to engage with course content. However there is nothing intrinsic to the medium that encourages the broad range of students to take advantage of these features.
- In areas of VET where the mode of delivery and the content are similar, such as information technology, online delivery provides a form of workplace training that is suitable both to the content and the students. In contrast, teaching and learning areas that require practical tasks or where the processes of communication, critical thinking and values clarification are central to the subject area, such as welfare or travel and tourism, are more difficult.
- Courses frequently make unequivocal assumptions about learner characteristics. (Students are motivated, literate, well organised and have high order cognitive skills). Often online students do not have these characteristics. In the present environment, suitability is more likely to be achieved in a situation where online learning, content and face-to-face contact are 'blended'.
- The teaching styles that facilitate effective online delivery of VET are strongly linked to teachers' attitudes and their use of the medium. However, some still assume that the acquisition of technical proficiency will guarantee sound practice.
- Interactivity is unequivocally regarded as the most effective teacher/student relationship to develop in an online environment. However, the use of the medium to encourage more critical thinking through debate and discussion is a relatively untapped strategy.
- Problem solving, investigation and research, and the pursuit of a theoretical understanding of content, are regarded as contributing to effective online learning at the individual learner level.
- The roles and skills of teachers and learners adapt or change, depending on whether the online delivery of VET supplements classroom time or replaces it. In both cases new approaches to time management and work patterns are required.
- The literacy demands and cultural homogeneity of many online courses and modules raises questions about the adequacy of the skills of students from non-English-speaking backgrounds and Aboriginal and Torres Strait Islander groups, as well as others with low levels of functional literacy.
- Fundamental issues such as the cultural appropriateness of questioning, conversational conventions, language acuity, and student attitudes towards interaction with authority take on a heightened importance in an online environment. In face-to-face classrooms, diversity is an asset. In an online environment it may be a distinct disadvantage.

Online pedagogy is frequently characterised as 'constructivist'. However the reality of delivery matches very poorly against the assumptions that underpin this particular view of teaching and learning, which are that individuals 'construct' new knowledge as they integrate new experiences and modify existing patterns. The teaching and learning process needs to acknowledge that students develop their own styles and preferences for learning using a variety of different resources.

Conclusions

The research findings show that, in terms of what we know about the factors that contribute to effective student learning, online pedagogy needs to address all the dimensions of practice.

In particular, online pedagogy in VET needs to be able to create teaching and learning environments where students have the opportunity to:

- reduce their reliance on text
- explore and value their intellectual, social and cultural backgrounds

- develop their knowledge beyond the transmission and assessment of content
- reflect on their own learning
- be part of an inclusive learning environment
- communicate extensively with their peers and their teachers
- become self-regulated and engaged with their own learning
- develop a group identity that connects them with their learning and with the broader social environment.

Introduction

Background

The focus on the online delivery of vocational education and training (VET) in Australia is clearly supported by both policy and funding. The Framework for National Collaboration in Flexible Learning in Vocational Education 2000–2004 identifies strategies that will lead to an improvement in student outcomes. The issue of the emerging pedagogy of online delivery of VET is at the heart of the Australian National Training Authority's (ANTA's) strategy for the VET sector for 1998 to 2003—*A bridge to the future* (ANTA 1998). How online materials are delivered, how teachers regard their roles and how students learn are crucial research questions that will inform the effective distribution of funds. By comparison with other aspects of online delivery of VET, these questions have received little research attention both in Australia and overseas.

The lack of research and disseminated results has led to a situation where technology is driving pedagogy (Brennan, McFadden & Law 2001). The new technologies certainly have the potential to generate new processes for teaching and learning but few of the possibilities have yet to be recognised.

The online delivery of VET in Australia is a complex and rapidly changing topic of both discussion and research. Given the levels of expenditure and policy interest in this area, it is critical that the learning outcomes for students and the impacts on teachers are evaluated. This research project focusses on the interactions between teachers, students, content and context, and creates a snapshot of online pedagogy.

Online delivery is unlike other education and training innovations. It is pervasive in ways that other pieces of technology such as the video could never have been. Information technology (IT) influences the operation of workplaces, facilitates the interactions of the commercial world and provides the superstructure for extending globalisation. Its application to the delivery of VET is a relatively small part of the growing dominance of information technology in our lives.

The major part of online delivery of VET is taking place in a range of combinations blended with other forms of student contact and support from staff.

Teachers, trainers, curriculum managers and instructional/educational designers are working on a range of initiatives in the online delivery of VET. Since there are large differences between the levels of technological expertise in both the teacher and learner groups, professional development is running in tandem with the development of materials and platforms which extend the use of information technology in the teaching and learning contexts. This is predicated on the assumption that growing familiarity with the technology will liberate teachers to focus on the effectiveness of the pedagogy.

This project has assessed the effectiveness of current pedagogy from the viewpoints of students, teacher practice, course content and delivery styles. The information gathered from these sources and others constitutes the composite picture of online practice. This profile has subsequently been overlaid by what we know about the constituent elements of 'productive pedagogies'. The results of this process provide insight into where work has to be done, future directions for research and the

generation of a challenging set of questions that need to be addressed if the technology is to deliver effective teaching and learning for all students in the VET sector.

This project builds on the results of the 2001 National Research and Evaluation Committee study, *All that glitters is not gold: An evaluation of the effectiveness of online delivery of education and training in Australia* (Brennan, McFadden & Law 2001).

Rationale for the study

The purpose of this study is to examine and make explicit the assumptions and practices which underpin the pedagogy of online delivery of VET where a variety of methodologies are used. It approaches the issue of online pedagogy from different perspectives: the practices and views of teachers, the learning styles and preferences of students, the implicit pedagogies of various modes of delivery, the identification of indicators of online pedagogical effectiveness based on the literature and an examination of a number of online courses in VET. The objectives of this research project were to:

- examine a range of current online pedagogical practices in VET and how these intersect with student learning styles and preferences
- generate a set of 'pedagogical effectiveness indicators' (PEIs) based on these practices and apply them to a range of current course offerings
- provide a robust body of knowledge in accessible formats which teachers/trainers can use to inform the methods of delivery that they use in VET to maximise the match between student needs and the technology available
- provide a robust body of knowledge that will be disseminated in a variety of formats which policy-makers can use when deciding on the extent and types of technology to fund and the kinds of staff and student support necessary to ensure that the investment in technology is maximised.

Research questions

The research questions were derived from the broad objectives listed above and parallel those generated by the earlier study (Brennan, McFadden & Law 2001). These questions reflect gaps in current knowledge about the online delivery of VET in Australia. The answers to these questions will assist in achieving improved student outcomes and higher levels of teacher professionalism and satisfaction.

The questions addressed by the current research are:

- What pedagogical assumptions underlie online delivery of training?
- What are the teaching and learning areas for which online delivery is best suited pedagogically? For what areas of teaching and learning is it not suited?
- What teaching and learning styles facilitate effective online learning?
- What interactions (at the individual learner level) are most effective in contributing to effective online learning?
- How does online learning affect the roles and skills required of those involved in the learning process?
- What relationships exist between pedagogical features and 'world's best practice' in online delivery and how does it incorporate these understandings?

Online pedagogy

'Pedagogy' covers the function, work, or art of a teacher or trainer. It includes the process of teaching and instruction. It is useful to think of pedagogy as being reflected in the arrangements made to enable someone to learn something for a specific purpose. These arrangements are influenced by:

- the general orientation of the teacher or trainer
- the kind of knowledge to be developed
- the nature of the learner
- the purpose the learning is to serve.

This study explores each of these aspects of online pedagogy. It builds on the work currently being done by other researchers for the National Centre for Vocational Education Research (NCVER). The projects which examine learner experiences and expectations (Choy, McNickle & Clayton 2002); quality online learning (Cashion & Palmieri 2002); Australian online education and training practices (Harper et al. 2000) and the evaluation of web-based flexible learning (McKavanagh et al. 2002) are particularly relevant as a body of knowledge relating to online pedagogy in Australia.

Methodology

In order to construct a comprehensive picture of online pedagogical practice in the VET sector in Australia, this project utilised a number of methodologies. These are:

- ✧ literature review
- ✧ development of an initial framework—the pedagogical effectiveness indicators (PEIs)
- ✧ interviews
- ✧ workshops
- ✧ development and analysis of student and teacher questionnaires
- ✧ at-desk activities analysing online course materials (online course filter).

Figure 1 demonstrates how data collected from the various stages of this project inform the findings.

The report has been divided into two volumes. Volume 1 contains a description of the project and its findings; volume 2 contains the appendices and is found on the National Centre for Vocational Education Research's (NCVER's) website, <www.ncver.edu.au>.

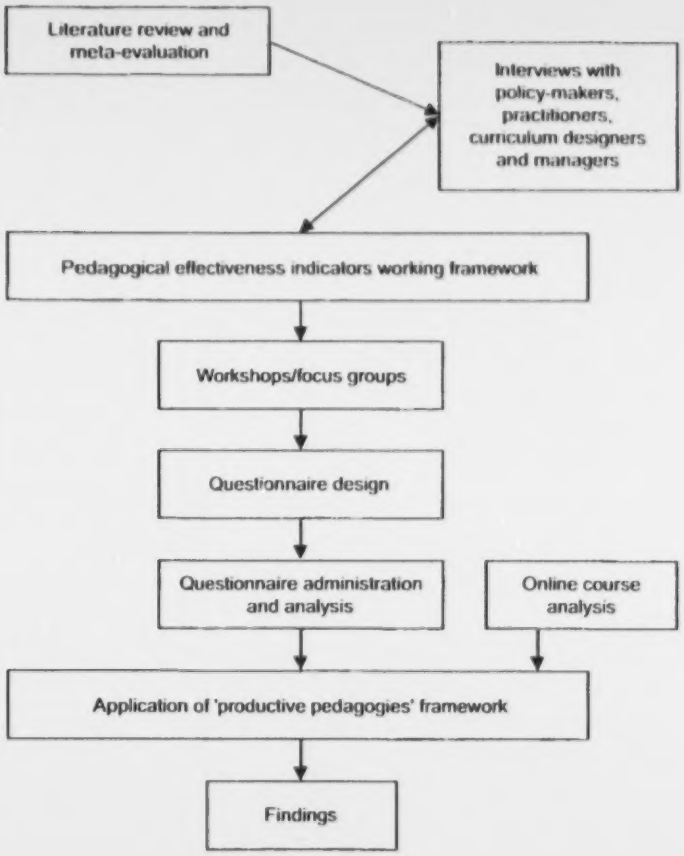
Literature review

The literature review built on Brennan, McFadden and Law (2001), with a specific focus on the compatibility between online delivery, the epistemologies of teachers and trainers and student learning styles.

The literature review incorporated material from both Australia and overseas and all were subject to a summative meta-evaluation (Straw & Cook 1990). This meta-evaluation weighed up the appropriateness of, and consistency between the various responses to the research questions and the reported outcomes of the studies.

The information was used to inform the subsequent stages of the research and was cross-referenced with the results obtained. This added to the credibility of this report by validating the findings of the other sections of the project through a process of systematic cross-referencing. One of the aims of the meta-evaluation of the literature was to identify a possible set of performance effectiveness indicators in the online environment that relate to a number of core questions posed by Bernstein (1996).

Figure 1: Project methodology



The interviews

Interviews were conducted by telephone and email with policy-makers, practitioners, curriculum designers and managers (table 1). The interviews were organised around the research questions. The interviewees represent the sectors of technical and further education (TAFE), adult community education (ACE), Education Network Australia (EdNA), ANTA, the Curriculum Corporation and private provision, and were selected because of their current crucial involvement in the development and promotion of online delivery of VET.

The interviews were transcribed and structured according to the research questions. The interview responses were also used to develop the indicators of pedagogical effectiveness, the working framework and the questionnaire content and design.

The results of these interviews appear in appendix 1.

Table 1: Project interviewees

Nick Pearl	National Toolbox Manager ANTA, Qld
Leslie Johnson	Director of Flexible Delivery ANTA, Qld
Garry Putland	Project Director EdNA online, SA
Ian Gaunt	Workforce Development Manager Hewlett Packard Consulting, Vic
Bruce Wilson	The Curriculum Corporation, Vic
Ian Hamilton	OTEN NSW TAFE, NSW
Alan Tonkin	Adult and Community Education Learning at Work, Vic
Guy Kemshal-Bell	Teacher/Researcher in Information Technology Riverina Institute of TAFE, Albury Campus, NSW
Eunice Askov	Lecturer/Course Coordinator Master in Adult Education Pennsylvania State University Online Campus United States

Site workshops

Workshops were carried out at the three participating sites, Holmesglen TAFE, Western Institute of TAFE and Canberra Institute of Technology. The research partners in each of these sites chose the participants on the basis of their experience and expertise in online delivery and support for education and training. All of the participants were experts in their own fields and represented the leading edge of technological implementation. The workshops lasted approximately five hours, with discussions organised around the research questions. The results of the workshops are described in full in appendix 2.

The aims of the workshops were to:

- explain the focus of the project and role of the three sites in achieving the outcomes
- collaboratively design the questionnaire/inventory (based on the potential pedagogical effectiveness indicators identified in the literature review) to be administered to teachers and students
- tap into state and national intelligence about the sites for the administration of the questionnaire (3–5 staff and 12–15 students per site, a crucial condition as the McKavanagh et al. 2002 study indicated).

Teacher and student questionnaires

The questionnaires were developed over a period of months. The focus areas for the questionnaires came from the literature review and meta-evaluation, the detailed interviews and the workshops. The findings from the surveys for both teachers and students are given in appendices 3 and 4 of this report respectively. The project information sheet and consent form are found in appendix 7.

The questionnaire was administered via post and in person. The sites were selected by the research team and represent:

- a rural/urban mix
- a range of content at Australian Qualifications Framework (AQF) levels
- a range of combinations of online delivery of VET from complete course delivery to the use of online facilities to supplement face-to-face delivery.

Like a number of other online studies, some difficulties were noted in the administration of the questionnaires which affected the response rates achieved.

Analysis of questionnaire data

The quantitative data gathered through the return of 200 teacher questionnaires and 110 student questionnaires was analysed using the SPSS statistical computer program. Replies to all questions were coded and entered for analysis. Frequency tables were created and 'strings' of written responses to specific questions were collated. A mixture of numerical and descriptive techniques were used to report on the data.

Online course filter

The literature, the interviewees and the workshop participants all agreed that a huge variety exists in the quality and effectiveness of the online courses available to students. It was considered that any discussion of effective online pedagogical practices must include a sampling of the online courses on offer.

The tool used to analyse the pedagogical principles on which these courses were based and the assumptions that underpin their design came from the initial framework, the pedagogical effectiveness indicators and the comments of the interviewees and workshop participants. A filter of questions was developed and members of the research team were asked to use this filter to categorise the various course sites. The courses were selected to provide a broad sweep of the estimated thousands available.

The analysis of the online course filter is given in appendix 5.

Literature review

The literature indicates that online pedagogy is a relatively new area of study and that educational issues relating to teaching and learning online have been caught up in the whirlwind of technological change and euphoria. In the VET sector, as in others, there is a growing awareness that effective online pedagogy involves issues such as interaction, changing teacher roles, student access, and matching articulated teaching skills to the needs and preferences of students. This review specifically explores the current wisdom relating to online pedagogy and the VET sector. The literature review incorporated material from both Australia and overseas and all were subject to a summative meta-evaluation (Straw & Cook 1990). This meta-evaluation weighed up the appropriateness of, and consistency between the various responses to the focus questions and the reported outcomes of the studies.

The information was used to inform the subsequent stages of the research and was cross-referenced with the results obtained. This added to the credibility of this report by validating the findings of the other sections of the project through a process of systematic cross-referencing. One of the aims of the meta-evaluation of the literature was to identify a possible set of pedagogical effectiveness indicators in the online environment. This review addresses the project research questions.

Introduction

The literature covered in this review comes from a range of different sources. There are reports from a number of major Australian, American, British and Japanese studies, smaller studies that appear in journals and online discussions and conferences. However, it is important to recognise from the outset that there is very little literature which discusses the pedagogy of online delivery specifically, or in any depth. A large number of the discussions in the literature look to the future, describing the potential of the technology but giving little about the current situation (Salmon 2000).

Defining pedagogy

Literature relating to the pedagogy of online delivery is very new (Schofield, Walsh & Melville 2000) with many participants having difficulty coming to terms with the topic (Schrum 1998). Only a few of the articles and presentations reviewed for this study provided specific definitions of the term 'pedagogy' as it applies to online delivery of VET.

The predominant themes in the literature are concerned with the mechanics of design, the process of implementation and some evaluations of student outcomes and staff participation, with the questions of access and useability dominating.

The three following definitions offer generic overviews of online pedagogy.

Schrum (1998) writes that:

> Pedagogical issues include the identification of learning goals, philosophical changes in teaching and learning, reconceptualisations of the teacher's role, evaluation of student and instructor, and the stimulation of interactivity. (Schrum 1998, p.56)

Firdyiwek (1999) defines online pedagogy as:

> ... being based on effective use of the electronic learning environments for the development of cognitive skills through access to information, interactivity with tools and communication. (Firdyiwek 1999, p.29)

This definition still shies away from a closer examination of the term 'effective' and gives no precise indication of how and why these cognitive skills are to be developed through sound teaching practices.

Brennan, McFadden and Law (2001) define online pedagogy as:

> ... a core of effective and traditional practices of teaching and training that have worked over time. Pedagogies are embedded in programs and practices as assumptions that influence the design and delivery of teaching and training. (Brennan, McFadden & Law 2001, p.24)

If technology is to be an effective tool for improving student learning beyond issues of accessibility, then these practices need to be explicit (Brown 1998) and discussable.

Current projects in the area

Three recent National Centre for Vocational Education Research (NCVER) publications, *The online experience: The state of Australian online education and training practices* (Harper et al. 2000), *All that glitters is not gold: An evaluation of the effectiveness of online delivery of education and training in Australia* (Brennan, McFadden & Law 2001) and *Getting to grips with online delivery* (Booker 2000) encapsulate current efforts to coherently map the territory related to online delivery.

These studies cover the broad issues involved in the discussion and deal with topics such as 'effectiveness', teacher and student reactions to online delivery, materials design, learner diversity and teacher/trainer preparation and professional development. Two major studies of online pedagogy, one from Australia and one from the Unites States, look at the multi-dimensional nature of pedagogy (Jasinski 1998; University of Illinois 1999).

The first Australian study (Jasinski 1998) involved about 80 VET practitioners, an online survey, three web forums and individual interviews. The author investigated issues relating to pedagogy online with a particular focus on identifying teaching and learning styles that facilitate online learning. The study produced the following findings:

> Technology does not cause learning. As an instructional medium online technologies will not in themselves improve or cause changes in learning. What improves learning is well-designed instruction. Online learning environments have many capabilities and the potential to widen options and opportunities available to teachers and learners. However, the key to changing conditions for improving learning is how these options and opportunities are utilised by teachers and learners. Technology is coming before pedagogy. The value of any technology for education is proportional to the need for that technology to realise educational objectives. We are constantly reminded that learning must be developed around learning needs, meeting educational objectives and producing viable graduates. However, at this stage of development, the effort put into exploring technologies to 'keep the cutting edge' is at the expense of equal investment in the underpinning educational design. (Jasinski 1998, p.1)

The second study was carried out at the University of Illinois (1999) and is an extensive examination of what constitutes good teaching and training practice. The report focusses on areas such as what constitutes good teaching either offline or online, the extent and validity of current evaluations of the effectiveness of online teaching and learning and surveys of online provision of education in the United States and beyond. The evaluation criteria were generated from the question: 'How do I determine if online teaching is successful?'

> In the short term, before history answers this question, we think that a rigorous comparison of learning competence with traditional classrooms should be done. High quality online teaching is not just a matter of transferring class notes or a videotaped lecture to the Internet; new paradigms of content delivery are needed. Particular features to look for in new courses are the strength of professor–students and student–student interactions, the depth at which students engage in the material, and the professor's and students' access to technical support. Evidence of academic maturity, such as critical thinking and synthesis of different areas of knowledge should be present in more extensive online programs. (University of Illinois 1999, p.3)

The final report of the VET teachers and online learning research project commissioned by TAFE NSW, titled *The online teacher* (Kemshal-Bell 2001), begins with an extensive review of the literature, embracing over 300 articles, papers, presentations and books. In the section titled 'Comments on research' (pp.10–15) Kemshal-Bell describes the changing role of the teacher and the effects this role change is having on teacher practice.

The author identifies the technical, facilitation and management skills required by online practitioners. Skills which enable effective use of email, forums, chat, website development and video and audio conferencing are discussed in detail (Kemshal-Bell 2001, pp.11–12). The facilitation skills that a teacher needs to have to ensure equivalent or improved student outcomes in an online environment include:

- ✧ engaging the learner (p.12)
- ✧ questioning (p.12)
- ✧ listening and feedback (p.13)
- ✧ providing direction and support (p.13)
- ✧ managing discussions (p.13)
- ✧ team building (p.14)
- ✧ relationship building, including virtual relationships (p.14)
- ✧ motivating (p.14)
- ✧ planning, monitoring and reviewing (p.15)
- ✧ time management (p.15).

Kemshal-Bell concludes:

> Most importantly, it is a combination of these skills that is essential. Online teachers need to know not only how to use the technology effectively, but also how to harness the power of technology through facilitation to achieve learning. On top of this, online teaching also calls for strong management skills to deal with the range of administrative and functional issues that arise. (Kemshal-Bell 2001, p.15)

The actual mixture of these attributes to form a coherent pedagogy remains unclear while the practitioners focus on the technology itself, its capacities and effects, and the skills required to make these attributes operational. The role of the instructor/teacher appears to be deprofessionalised by comparison with the perceived professional role of the face-to-face teacher or trainer. These themes

recur in other literature (Holzl & Khurana 2000; Zorfass, Remz & Gold 1998; Mitchell & Bluer 2000).

A joint project between the Research Centre for Vocational Education and Training, University of Technology Sydney (RCVET) and the Adelaide Institute of TAFE and TAFE SA, entitled *Online learning and the new VET practitioner* (Schofield, Walsh & Melville 2001) addressed this lack of research. It focussed on the knowledge and experiences with online learning and teaching of 18 self-selected VET practitioners from different backgrounds and disparate ages.

> What emerged was a picture of a group of leading edge, enthusiastic and motivated practitioners working with each other and sharing their experiences, but struggling (at least in this early stage) to integrate online work more fully within their work environments and engage immediate work colleagues in the process. It also showed a group of practitioners still operating outside the 'mainstream' of VET practice. (Schofield, Walsh & Melville 2001, p.12)

This current research indicates that VET online practitioners are primarily concerned about issues concerned with teaching and pedagogy in the online environment and include:

- ✧ constructing knowledge about online learning
- ✧ changing professional roles and practice
- ✧ the workplace learning of VET practitioners
- ✧ the organisational context of online teaching and learning.

These themes confirm other research findings in the area (Holzl & Khurana 2000; University of Illinois 1999; Bennett, Priest & McPherson 1999).

The literature and the research questions

How effective is online delivery in catering for different student needs and learning styles?

This section of the review focusses on the measures of effectiveness of online delivery, learning theory, instructional strategies and the views of students and teachers about the effective matching of materials, styles of delivery and student learning needs.

Pedagogical discussions in the literature relating to face-to-face or distance education generally focus on what the teacher is doing, the effects of these activities on the learners and how other external factors such as social class, motivation and learner background impinge on the effectiveness of the relationship between teacher, learner and content. Therefore, measures and descriptions of how student learning styles and preferences are effectively accommodated is one way in which online pedagogy can begin to be examined.

Effectiveness

This concept is difficult to tie down. One person's effectiveness is another person's failure (Brennan et al. 2001). The content of the material being delivered, the structure of the curriculum and the institutional and policy constraints in VET vary, as does the extent to which teachers feel that they have control over and confidence in both the medium and the message. Nevertheless, assertions about effectiveness are prevalent in the literature (Brennan et al. 2001; Beach 2000).

However, access does not necessarily equate with an effective match between the medium, the content and the learner styles and preferences. Student perceptions of the effectiveness of the new technologies is a relatively under-researched and under-reported area. In many studies of the relationship between technology and student outcomes, the benchmarks used to make these judgements are frequently external to the students.

Case studies, interviews and focus groups that move beyond the surface of student performance to issues of motivation, engagement and achievement are beginning to achieve credibility as measures of effectiveness (Brennan et al. 2001; Cashion & Palmieri 2002; Selwyn 1999; Slay 1997; Wallace 2000). The systematic analysis of communication and interaction in online teaching and training environments is also providing another rich source of information about how students learn online and the relative effectiveness of this learning (Choy et al. 2002; Jasinski 1998; Ross & Schulz 1999).

Learning theory, online delivery and pedagogy

By making the assumptions which underpin different types of online delivery explicit, and by placing the variety of online strategies in a theoretical framework, we are more able to get a picture of how delivery matches learning styles and preferences.

It is claimed that the new media cater for individual learning styles and preferences and that the practice of teaching makes use of these features. Assertions made about the new media include that: online learning has the capacity to create active engagement; it is readily accessible; it provides learners with many choices about information; it speeds up communication between learners and between the teacher and the learner, and it removes unhelpful time constraints (O'Connor 2000; Kerka 1996). These assertions are summarised in the literature and the counter-arguments are presented (Booker 2000).

The capacities listed above do exist, but the scope of their effectiveness, take-up rates and the ability of teachers to develop adequate pedagogical practices to match the capacities are yet untested (Dede 1996 in Kerka 1996; Rice 1997; University of Illinois 1999; Pan 1998; Bennett et al. 1999; Stein et al. 1999).

An examination of the pedagogy of three commonly used software systems for online delivery, WebCT, TopClass and Web Course in a Box, was conducted by Firdyiwek (1999). This study ascribed different theories of learning and cognition to the systems in an attempt to define the pedagogical principles underscoring their operation.

The author identified three dominant paradigm—the behaviourist/empiricist, the cognitive/rationalist, and the situative/pragmatist. These three theoretical views of learning and cognition were then applied as filters to the three online environments in an attempt to describe the pedagogies that emerged from their operation.

> These three theoretical perspectives and the pedagogical assumptions that evolve out of them map well against the components of courseware systems and the pedagogical practices implied in their integration. The types of tools provided (such as those for assessment, authoring, and communication) and the stance taken on flexibility in the definition of roles (administrator, instructor and student) reflect broadly one or other of the three theoretical perspectives mentioned above, even if this is not made explicit by the developers of the tools.
>
> (Firdyiwek 1999, p.30)

Behavioural learning theory and its accompanying pedagogy is predicated on the view that if we present information to a learner, check the learner's response, provide feedback and then either proceed or revise, the learner's behaviour will change. As Dewald (1999) notes: 'Behavioural learning theory is the basis of traditional learning environments that are geared for efficiently transmitting information and basic skills to students in a well organised manner (p.2)'.

Cognitivists present the view that the individual has an assembled body of knowledge and that new learning needs to be accommodated into this pattern. Learners learn when they are actively engaged with their materials and tasks. Constructivism, where learners construct knowledge for themselves either individually or socially as they learn, extends these principles. Online technologies offer ways of teaching and learning that are multiple, alternative and cater for different learning styles and preferences (Brown 1998).

Instructional strategies and assessment

The instructional strategies currently used in Australia give some indication of how well the online environment caters for students' needs and learning styles. In this environment delivery of content online is the most common strategy used in Australia (Brown 1998; Harper et al. 2000; McKavanagh et al. 2002). The interaction and communication capabilities of the medium are still under-utilised for a variety of reasons, although email is increasingly being used to enable teachers and students to stay in touch (Harper et al. 2000; Kerka 1996). The University of Indiana study (Graham et al. 2000) provides a detailed evaluation of the teaching strategies being used.

Assessment is also occurring online. While strategies such as electronic portfolios and diaries are being used in some online courses, assessment methods are often limited to short-answer and multiple-choice items. More extensive, in-depth assessment items which tap into the developmental aspects of learning are not yet the province of the online assessor.

What do online learners say?

This topic has been addressed extensively in the Harper et al. study (2000) and the literature has been surveyed and the results collated (Brennan et al. 2001). The two studies found that the flexibility of the new technologies is especially attractive for some learners, particularly mature adults with many other competing pressures in their lives. The studies also found that there is more communication between previously isolated learners. Where the effectiveness of the online learning was undisputed, there had been a clear focus on collaboration, communication, interactivity, and problem-based learning.

The qualification to all these statements is that we have a tendency to generically classify our learners, a position which is not adopted by the literature. In VET, the differences in styles, predispositions, preferences and levels of engagement with learning are crucial factors in assessing the effectiveness of online delivery methods from the perspective of students. We cannot assume that they are homogenous or that they possess the characteristics of adult learners that produce the kinds of results described above.

> While there are clear theories and principles for adult learners, namely described as andragogy, none are evident for youth learners, notwithstanding the recent debates surrounding the andragogy–pedagogy dichotomy claim that the teaching of youths is significantly different from the teaching of adults (Delahaye, Limerick & Hear 1994). Three attributes generally associated with adult learning are a deep approach to learning … and a high level of self directed learning. Whether youth share these attributes common in most adult learners is not apparent in the literature. A recent major study, of which this paper reports the results for TAFE students, showed that most youth learners did not share adult learning characteristics.
>
> (Choy & Delahaye 2001, *pp. 1–2).*

The Choy and Delahaye (2001) study addressed the shortage of learner perspectives on the effectiveness of online learning.

> In view of the deficiency in research informing about services for online learners, a national study was conducted to explore the expectations and experiences of online learners in the VET sector. (Choy & Delahaye 2001, p.1)

The study found that student evaluations of the quality of their own learning focussed on issues of:

> … regular contact with teachers/tutors; quick responses from teachers/tutors; regular support for learning … They believed that regular communications with teachers/tutors as well as peers through emails or telephone was important to motivate and encourage them to continue with their learning. As the technologies that support online delivery are recognised for speedy communication, learners expect quick responses … According to the interviewees there were two main limitations in the current online services that related to facilitation and the technical

> system. Many believed that teachers did not provide clear guidelines or explanations of their expectations from learners. The interviewees shared a common view that many teachers/tutors are not adequately trained for online delivery. Some learners identified limitations in technical knowledge (of teachers) in the use of online delivery. (Choy & Delahaye 2001, p.11)

Other learners commented that changes in the teaching staff and the inappropriate design of the web-based materials were limiting factors in their learning, as were technical and navigational problems associated with their course materials (Choy & Delahaye 2001, p.11).

What do online teachers say?

The literature is beginning to focus on the role of the teacher and teaching activities online and there are some differences and similarities in opinions (Schofield, Walsh & Melville 2000; Kemshal-Bell 2001). The Schofield, Walsh and Melville (2000) study showed that most teachers believed that:

> ... good online teaching is about building community, caring for students and being responsive ... [it is about] ... being imaginative and creative, a lateral thinker. This was most frequently coupled with the attribute of being a risk taker, someone who was prepared to get out of their comfort zone and try new things, to experiment.
>
> (Schofield, Walsh & Melville 2000, p.6)

A number of teachers commented on the workload issues associated with online delivery and the undervaluing of work and time (Brennan et al. 2001). Computer skills were also considered an important precondition for good online teaching, as were patience, flexibility, good planning and having a learner-centred philosophy. The most recent trends in pedagogy have been towards a constructivist view of learning where the student brings his/her prior knowledge and experience to bear on new information, and thereby constructs new knowledge. It acknowledges that students develop their own styles and preferences for learning using a variety of different resources.

Summary

'Effectiveness' and 'access' are often used interchangeably in discussions of online delivery, thereby muddying the intellectual waters. More recent studies of online delivery have focussed on in-depth analysis of student and teacher reactions to the online environment and on the applicability of learning theories in this new context. Extensive studies of teacher and student attitudes and practices have produced valuable insights into what is happening in online delivery of VET in Australia. However, a judgement on the effectiveness of online delivery to cater for different student needs and learning styles requires an integrated analysis beyond these studies. As yet there is no overarching framework of pedagogy within which these data can be placed and evaluated.

How is knowledge constructed online and how are online skills acquired?

The discussion in the literature of how knowledge is constructed online and how skills are learnt is wide-ranging.

> While there is no one 'best' teaching method some methods and combination of methods are better than others at realising the sort of constructive engagement with learning activities that lead to changes in understanding (Ramsden 1992) ... For example, Stevenson (1994, 1995) argues that, in order for learners to achieve expertise, learning needs to be deep, conceptual and reflective, with strong links between concepts and practice ... Ramsden (1992) argues that teachers can encourage such approaches to learning by promoting reflective activity and dialogue ... Teaching is a sort of conversation. (McKavanagh et al. 2002, pp.19–20)

Good teaching involves rich conversations. Sharing ideas, a practice facilitated by the more interactive use of the new technologies, encourages discussion, critical thinking and the formation of new knowledge (Harper et al. 2000; O'Connor 2000). Problem-based learning which has been

referred to as: '... exploratory conversation and issues based analysis ...' (Duffy et al. 1998, p.20) exploits these online capacities and provides another theoretical framework for explaining how learning occurs.

> Asynchronous discussion environments ... afford us enormous pedagogical opportunities ... they afford students the time for thoughtful analysis, reflection and composition as their discussion of issues evolves. (Duffy, Dueber & Hawley 1998, pp.22–3)

The Duffy, Dueber and Hawley study includes examples from United States-based programs and describes the mechanics of messages and postings in a problem-based learning context. This study was conducted in the higher education sector and is limited by the assumption that there are high levels of intrinsic student motivation that are not always present in other sectors of education and training (Choy & Delahaye 2001).

The interactive, collaborative and discursive capabilities of online teaching and learning fit well into the set of strategies now considered good teaching practice (Lau 2000; Brown 1998). Constructivist views of learning and knowledge creation help to explain how this happens.

The interactions between students and materials and colleagues and teachers and facilitators can be both 'formal-guided' and 'informal-exploratory'. This process is frequently a collaborative activity. Bull et al. (1999) describe four stages of facilitated learning in a constructivist environment:

- ✧ Students are exposed to new material that is linked to their existing knowledge.
- ✧ Coaching is provided to assist students in assimilating and accommodating new knowledge.
- ✧ Students' understandings are refined through testing the validity of the new material.
- ✧ Students are given multiple opportunities to practise and apply new material.

The potential freedom of the new technologies is well suited to constructivist strategies. However, the more interactive, navigationally focussed and communication-hungry technologies also require thoughtful implementation, scaffolded support for students, and teachers and trainers who are both confident and comfortable with this new way of working (Holzl & Khurana 2000). There is nothing magical in the medium that guarantees the creation of an effective constructivist environment. In fact, quite the reverse may be true.

The literature reports that students often confront extensive blockages to their acquisition of knowledge and skills online (Harper et al. 2000; Brennan, McFadden & Law 2001). Technological difficulties, lack of motivation, high levels of potential misunderstanding (Kerka 1996) and uncertainty about personal technical competence militate against effective learning in a constructivist environment. Students also seem to be reluctant to expose personal ideas and to develop concepts online (Lau 2000) and interchanges, when they do occur, are often brief, truncated and non-developmental (Duffy et al. 1998). Low retention rates in a number of online courses are suggested as an indicator of the lack of quality and disengagement of students from this medium and the possible failure of constructivist pedagogical practice.

Other authors maintain that online learning can be constructivist if the materials are carefully designed and presented online. The extent of learner control over the process of searching is seen as a measure of the constructivism potentially implicit in the new technologies (Brown 1998). Prerequisites for student success include engagement with the medium and a relatively high level of intrinsic motivation and persistence (Beach 2000; Kingham 2000; Kerka, 1996).

Summary

The literature focusses on the potential of the new technologies to create new pathways for the development of student knowledge and skills. Furthermore, these technologies have the capacity to facilitate constructivist learning. However, there are a number of factors militating against this

medium that need to be acknowledged, and addressed by the design of course materials and teaching strategies that encourage interaction, conversation and student confidence.

What constitutes a robust body of knowledge about online pedagogy?

This section of the review concentrates on literature which attempts:

- ✧ to develop principles of sound online pedagogy
- ✧ to define the relationship between existing theories of learning and online pedagogy
- ✧ to examine the transferability of face-to-face pedagogy to an online environment
- ✧ to identify the current barriers to the development of a robust online pedagogy.

As Harper et al. (2000) note: 'There is currently no accepted wisdom on how to implement online learning, either in Australia or internationally' (p.46).

Face-to-face instruction has a rich pedagogical literature. Currently, it focusses on contextual learning, student-centred learning, problem-based learning and individual participation in the process of constructing new knowledge (Brown 1998). The complex relationships between teacher practice, student background and experience, material content and delivery styles are the topics of discussions on face-to-face pedagogy. It would seem reasonable that a robust body of knowledge about online pedagogy should also include an integrated appreciation of how and why practice leads to student learning.

In the literature of online delivery, the pedagogical practices include long lists of teacher skills and possible student learning experiences (Dewald 1999). These lists provide some guidance about what teaching practices are possible but there is no coherent picture of how teachers mix and match the strategies and on what basis they make these professional judgements.

Kerka (1999) stresses the importance of meticulous design of online materials while Booker (2000) provides a list of questions to ask about the teacher–student relationship and identifies the essential features of instructional and interface design. The Indiana University evaluation of online delivery of courses (Graham et al. 2000) outlined the principles of good practice. Duchastel (1996 cited in Schrum 1998) proposes a continuum of practice which takes the student along the path from being a recipient of transmitted information to interaction with the materials in a way where students are more in control of their own learning.

The use of technology is expected to result in an improvement in student outcomes, as well as, on the part of learners, increased independence, engagement, motivation, research skills and improved results on standard pieces of assessment. It is doubtful and unproved that these outcomes have been achieved. The pedagogy that will lead to the achievement of these outcomes is even less clear as there is no integration of the various dimensions of pedagogy into a coherent whole, a theme that is reiterated by policy-makers and online managers and practitioners.

Learning theories and pedagogy

In order to understand and legitimise the pedagogy of online delivery, a number of authors have linked the different aspects of the technology to different learning theories. Dewald (1999) compares the relative roles of the teacher and student in two online training systems located at different ends of the learning continuum, the instructional systems design model (ISD) and the hypermedia design model (HDM), in an attempt to isolate the pedagogical differences between these two systems. The first model is based on the systematic and sometimes tedious guidance of the learner through tasks and accompanying assessments, while the latter model assumes a huge component of learner independence, confidence and motivation.

Powers (1999) focussed on the delivery of online information technology subjects and how the method of delivery is explicitly linked to sound pedagogical principles. In this study, instructional strategies are discussed as being equivalent to pedagogy and the strategies for course delivery included creating a 'class cybersociety' (p.226) and using self-guided online labs and online student portfolios (Powers 1999).

The model of teaching and learning online proposed by Salmon (2000) attempts to map the progress of student and teaching interaction as they move through stages of e-learning, being supported on both a technical and educational level. The result is a linear model of developing comfort and efficacy with the medium. There is also an attempt to relate pedagogy to the stage of technical ability and independence of the learner.

O'Connor (2000) details the stages of effective learner engagement and teacher responsibility in an online environment. These stages, listed below, represent a continuum of development and imply a set of accompanying pedagogical practices:

- access and motivation
- online socialisation
- information exchange
- knowledge construction
- development.

In general, the literature establishes a number of prerequisites that will lead to the development of a rigorous online pedagogy. These include:

- a thorough understanding of the mechanics of the medium
- a methodology to enable transfer of teachers' and trainer knowledge to the new medium
- the skills to navigate, reflect, evaluate and then change practice
- a sense of 'pedagogical integration' (Firdyiwek 1999, p.29)
- the ability of those working in the creation and the use of the new tools to affect this integration.

A 1997 study completed on behalf of the Australian National Training Authority, *From desk to disk* (ANTA 1997), aligns teacher practice with the particular proportion of online and other forms of delivery in individual courses. These mixtures were defined under four broad categories labelled as 'options' and general pedagogical features were assigned to each.

In option 1, where training is delivered completely online, procedures and teacher practice is generic and limited. Option 2 looks at a learning centre that has a mixture of online and face-to-face delivery where teachers and information technology staff 'act as tutors in the centre and assist with both content and technical questions. Option 3 is about online as a 'supplement' to print-based forms of delivery' (p.46), where access to staff and currency of resources are the advantage. The final option, option 4, is online delivery as a supplement to full classroom activity with customised materials and quick communication. Teaching practice is flexible and pedagogical features reflect responsiveness to student needs (ANTA 1997). Each of these options imposes new relationships on teachers and students.

A number of major online studies commissioned by NCVER recognise the importance and the changing role of the teacher in these different contexts. It is no longer acceptable to assume that the skills developed in face-to-face teaching can be instantly transferred to the online environment with either ease or good results. The practice of teaching has to be reconceptualised.

Oliver, Omari and Herrington (1997) cited in Harper et al. (2000) have recommended that online pedagogical practices and the reconceptualisation of the role of the teacher should be based on strategies such as:

- carefully planning group composition
- requiring learners to provide feedback on their outcomes in order to maintain focus and ensure completion of learning activities
- introducing learning activities after the learners have become familiar with the WWW environment
- employing more adaptive forms of scaffolding for selective assistance.

(Oliver, Omari & Hetherington 1997 cited in Harper et al. 2000, p.19)

Transferability

> There is an acceptance of the notion that traditional face-to-face instructional strategies and resources need to be reconceptualised for online learning. (Harper et al. 2000, p.46)

Although, as noted above, a number of commentators argue that traditional teaching methodologies and materials require reconceptualisation to accommodate the new technologies, some authors maintain that characteristics which constitute sound pedagogy when used face to face are applicable and transferable to the new technological media (O'Connor 2000). Curriculum planning, goals and outcomes, resources, facilitation and assessment remain the same in an online environment as they do in an offline one and, argues O'Connor, we live in a world of changing pedagogical emphases where teachers and trainers are now much more student-centred, where co-operation is fostered over competition and where learning is far more self-paced and self-selected (O'Connor 2000).

While these characteristics remain the same, it is clear that there is a need for new models of teaching, a theme reiterated in the literature surveyed by Brown (1998). Online teaching and learning has focussed our attention on current learning theories, and recognition of the need to evaluate all aspects of our practice has been the result.

> To exploit e-learning for teaching we must understand its potential, which is different from that of any other teaching medium and we must be trained to understand e-learning, and to add real value for the online participants. (Salmon 2000)

However, there is little developmental investigation or discussion of how these skills are developed or how they constitute a robust body of knowledge about online delivery.

Barriers to a robust body of pedagogical knowledge

Some authors maintain that the lack of a robust pedagogy is due to the distance created between those who construct and design and those who implement and teach (Firdyiwek 1999; Brennan, McFadden & Law 2001). In the absence of input in the creation stage, the implementers often fall into the trap of being technological operators whose job is de-skilled, the job itself focussing on decoding the technology for use by students. In such circumstances, the robustness of the pedagogy is, of course, quite questionable. Those with the experience have lost their way.

The speed of technological change and the inability of those struggling with new features to systematically evaluate and reflect on their practice in the new environments militates against the building of a concerted body of knowledge (Brennan et al. 2001).

Several authors have identified a number of constraining factors which prevent the definition of a robust online pedagogy (Firdyiwek 1999). The lack of contact between designers and educators and trainers creates camps of online workers who do not communicate openly or often.

> The tools and features (the designers) provide need to be more carefully selected and better integrated so as not to end up confusing and alienating users, or worse, implicitly encouraging pedagogically suspect practices. (Firdyiwek 1999, p.34)

Pedagogy results from exploration, evaluation, reflection and a modification of practice on the basis of these results. To date there was been little opportunity for exploration and documentation of this cycle in an any integrated or coherent manner. The lack of reported evaluations (Harper et al. 2000) exemplifies this gap.

Barriers to change are summarised by Simoff and Maher cited in Harper et al. (2000).

> Experience from implementation of online courses suggested that traditional face-to-face strategies need to be reconceptualised to take advantage of the unique opportunities offered by the emerging online technologies. (Simoff & Maher 1997 cited in Harper et al. 2000, p.18)

The studies carried out by the University of Illinois (1999) and the University of Indiana (Graham et al. 2000) are exceptions and are specifically related to the tertiary sector.

Summary

Face-to-face instruction displays no shortage of pedagogical analysis. However, the analysis of online delivery seems to have jettisoned the lessons from this research in favour of lists of skills and student attributes. In an attempt to acknowledge the uniqueness of the new learning environments and accommodate the pace of change, the tried-and-true teaching and learning precepts are relegated to an inferior status. Reconceptualisation of pedagogical roles has discredited the possibility of transferability of teaching skills to new contexts. There is a palpable lack of coherence in discussions about online pedagogy, with studies focussing on the individual elements of the learning equation rather than on attempting to bring together teachers, students and course materials as a starting point for discussions about pedagogy.

How does world's best practice inform the discussion of the pedagogy of online delivery of VET in Australia?

The elements of world's best practice in online delivery can be identified from a number of major studies. The Indiana University study (Graham et al. 2000) reports on the evaluations of four online courses and lists the features of 'best practice' emerging from this detailed study, as follows:

- prompt feedback on both contributions and new information
- time on task
- high expectations
- respect for diversity.

This study also reports on a variety of strategies for achieving these features of best practice.

From desk to disk: Staff development for VET staff in flexible delivery (ANTA 1997) is a broad survey of current practice in online delivery and defines 'best practice' as:

> … those attributes and practices that will lead to effective learning outcomes using online technology. (ANTA 1997, p.44)

The seven key principles of best practice distilled from this research are:

- developing a network of support (pp.45–6)
- ensuring a variety of learning styles and preferences (pp.46–7)
- designing interactive learning materials (pp.47–8)
- ensuring educationally driven projects (p.48)

- ✧ providing organisational and financial support (p.48)
- ✧ ensuring adequate security (p.49)
- ✧ using a planning tool (p.49).

Service and interaction are also identified as crucial elements of best practice, as is peer support and supervisory and tutorial support (ANTA 1997). The roles, tasks and skills required by all those involved in online delivery are clearly spelled out in the Booker (2000) publication.

Jasinski (1998) gives examples of online delivery methods suited to different environments, with a focus on the differences between learners and their contexts. These two studies contain a mixture of practical advice and theoretical discussion to underpin the choice of strategies and software. Both emphasise the importance of matching the medium to the students, and the institutional and administrative constraints that teachers will need to confront and solve if 'best practice' is to be achieved. These themes are also reflected in the findings of the University of Indiana (Graham et al. 2000) and University of Illinois (1999) studies.

However, practice is not pedagogy, and pedagogically sound principles again have to be inferred. A recent study tour of the United States by the author to study online delivery at a number of selected sites, including the University of Illinois, showed that best practice is characterised by both a mixture of contact modes and a strong emphasis on the importance of establishing community spirit, either technologically or preferably face-to-face, to ensure common levels of technological competence.

This principle is emphasised in the Harper et al. study:

> The preparation of students for the demands of the online environment, so that they are able to adapt readily to the new environment and to capitalise on its advantages, was also a major issue for students. In addition to providing technical training and support, some institutions are attempting to raise awareness and address expectations of prospective and beginning online students. (Harper et al. 2000, p.26)

Summary

Discussions of 'best practice' in the pedagogy of online delivery reflect the development of a more generic set of features which contribute to effective teaching and learning. The preparation of students and teachers to work online (induction) and the deliberate creation of a learning community are two crucial factors which, if present, help to guarantee success. However, the absence of a theoretical framework within which the 'themes' can be located, weighted and evaluated is a stark reminder of the limitations of even well-researched lists.

What factors are driving pedagogical change in the online delivery of VET?

This section examines the factors driving pedagogical change and includes cost-effectiveness, teacher/trainer confidence, student reactions, collaboration, policy initiatives, commerce and education.

Cost-effectiveness

Issues concerning cost-effectiveness of online delivery of VET are currently being debated and are creating an atmosphere of examination and reflection. Some researchers believe that the imperative for reducing costs of delivery of education and training is the primary driver of online learning expansion (McArthur & Lewis 2001). Limited models for determining cost-effectiveness that focus on materials design and the capacity to deliver education and training to mass audiences are clearly inadequate. The more expansive models for determining cost-effectiveness that include considerations of the quality of the materials and the student experience are controversial and contested. However, there is no one method for assessing the cost-effectiveness of online learning,

and in this state of flux the need to examine pedagogy is emerging as one dimension of the discussion (Marquardt & Kearsley 1999; Ryan 1998; Betz 2000; Carlson et al. 1998).

Large amounts of money and time have been spent on establishing online delivery systems and providing the professional development necessary to support it. This is largely attributable to a belief by the policy-makers of the benefits of online delivery (Marquardt & Kearsley 1999). Questions about cost-effectiveness have moved beyond the early debates about number of hits assessed against cost of setting up the system, and the effectiveness of student learning outcomes are beginning to be factored into the discussion (Betz 2000).

The early attempts at assessing cost-effectiveness focussed on transmission of information, with the issue of access assuming primary importance. Moving beyond access issues to a closer look at student learning outcomes has led to a focus on pedagogical practice as it exists in an online delivery mode. This discussion remains in its infancy, but has developed significantly in recent Australian work; see for example, Curtain (2002).

Teacher/trainer confidence

Online teachers and trainers have a pedagogical background that, in most cases, began with face-to-face contact with students. They have brought with them skills from another medium and their level of satisfaction in working online has not always been as high as it might be (Brennan et al. 2001). Questions about what is transferable from face-to-face contact to an online environment have to be asked and answered. This has been overlaid by a natural reluctance on the part of teachers and trainers to progress too far with a new technology and one with which they are not necessarily confident (Lau 2000). The more experienced face-to-face teacher may also be a novice online teacher and the skills of the experienced teacher are not necessarily useful or adaptable.

Student reactions

Student evaluations, the results of research into student satisfaction levels, literature relating to the lack of improved student outcomes online and the high attrition rates in online courses all provide a strong stimulus to further work in the area of online pedagogy. The tendency to think that delivery online is intrinsically effective is being replaced by a deep interest in how teaching and learning can be made more satisfying and achievable.

Collaboration

Major national initiatives such as Learnscope and the funding of collaborative research between industry, VET practitioners and the tertiary sector are producing new partnerships where the lines between theory and practice are being bridged.

Policy initiatives

The huge investment of public money involved in building the infrastructure as well as providing training staff to take advantage of online facilities are significant factors contributing to the growing interest in online pedagogy. The need for public accountability represents another. Two major Australian policy initiatives are the Commonwealth Government's *Strategic framework for the information society* (1998) and ANTA's *Australia's national strategy for vocational education and training 1998–2003: A bridge to the future.*

Commerce and education

In a globalised economy, the providers of education and training have proliferated. The availability of online courses has meant that education and training is accessible in new ways to a growing audience of people. Industry and enterprise have begun to take advantage of this flexibility (Sargant 2000). Since online delivery of training requires a substantial investment of funds, the relative 'profitability' of online delivery poses a significant question in the open market. In a highly

competitive educational environment, traditional providers of education and training are extending their spheres of influence by offering online delivery and support (Ryan 1998). The lines between commercial and educational activities become contested in this context, and after the first wave of technological euphoria has evaporated, institutions are beginning to evaluate and focus more on the pedagogical implications of delivery.

Summary

The factors driving pedagogical change include cost-effectiveness, teacher/trainer confidence, student reactions, collaboration, policy initiatives, and the relationship between economics and education. The 'second wave' of technology has encouraged a stronger focus on the pedagogy of online delivery of VET in Australia, as teachers and researchers move beyond the use of the 'equipment' to an evaluation of what we are doing and why.

Conclusion

The literature review indicated that a variety of methodologies have been used by researchers to collect insights into online pedagogy. Online teaching practice has been examined from a variety of standpoints, including concepts of effectiveness, learning theory, students' learning styles and preferences, instructional strategies, the construction of knowledge and skills online, aspects of a robust online pedagogy, world's best practice and factors driving pedagogical change. The literature generated a large number of factual premises. Thus the reports and conclusions about the 'nature, performance and impact' of online pedagogy that can be legitimately synthesised by the researcher for further evaluation.

The principles of meta-evaluation have been used to distil the themes and threads from the literature for this further analysis.

> Meta-evaluation is ... tied to a critical perspective in which no single evaluation or evaluation report should be considered definitive. The most technically competent evaluation in terms of methodology may still be flawed when broader issues of interpretations or policy implications are discussed. The goal of meta-evaluation is to obtain a broader range of views by soliciting heterogeneous perspectives on a study or a group of studies. The synthesis of these various perspectives is intended to raise the reader's consciousness about all issues relevant to the program being evaluated. (Straw & Cook 1990, p.58)

The meta-evaluation of the literature has been used to inform the framework of indicators of pedagogical effectiveness which have been tested and refined through the process of interviews with practitioners, policy-makers, course designers, evaluators and managers of online learning initiatives. The development of the framework is described in the following chapter, while details of the interviews are given in appendix 1.

A framework for online pedagogy

Introduction—exemplars from the literature

A discussion of the online pedagogy of VET delivery is more than problematic. The technological environment can change overnight, definitions expand and contract, delivery methods alter their focus, the student clientele changes its expectations and behaviours, and the relationship between teachers, learners, content and context are worlds away from the common understanding of what constitutes teaching and learning.

The literature reviewed for this study is clearly limited by its concentration on the surface features of pedagogy. There have been few attempts in the literature to impose any kind of organising framework on the aspects of pedagogy discussed, or to integrate the features of pedagogy into a broader picture of what happens online. This integration is crucial to our analysis of current online practices and our recommendations for change. For this reason, the work of Bernstein (1996) and an Australian study by Ailwood et al. (2000) is relevant here.

Bernstein (1996) considers pedagogy in terms of 'framing'—who controls what? He has analysed and described pedagogic practice by imposing a set of categories on the teaching and learning environment and by analysing the interactions that take place between teacher and student in this environment. The framework for analysing pedagogy provides a way of tying together the information and research results described in the literature review.

The process of framing (Bernstein 1996) involves an analysis of the following dimensions of pedagogy:

- the selection of communication
- its sequencing (what comes first and what comes second)
- its pacing (the rate of expected acquisition)
- the criteria
- the control over the social base which makes this transmission possible

(Bernstein 1996, p.27)

An examination of these issues provides information about the relative roles of the teacher, learner and the context for learning and makes judgements about pedagogy as a consequence. The answers therefore help to resolve the research questions at the heart of this project.

In this study, the pedagogy of the online environment in VET can be 'framed' in the following way.

Selection of communication

The online environment offers forms of communication that include email, web-based forums, bulletin boards, chat, print-based expositions, video-streaming, sound, cartoons, quizzes and embedded links to the world wide web.

The selection of the forms of communication used is circumscribed by factors, such as the practice of materials design, teacher availability, the technological capacity of both teacher and/or learner,

budgeting considerations, teacher acumen and comfort, the extent of course accreditation, and the characteristics of the learners.

Sequencing

The sequencing of teacher–learner activities varies remarkably in the online environment. Some materials are sequenced in a lock-step process and complemented by assessment hurdles at regular intervals. Other materials are constructivist in intent, while others encourage flexible movement paced by the learner him/herself. The level of complexity of the materials being delivered, the technological competence of the teacher and learner, and the accreditation or otherwise of the particular online course also influences the sequencing of the materials and activities.

Pacing

The rate of anticipated acquisition of knowledge and skills varies in tandem with the sequencing. Some online courses are paced according to a linear sequential view of knowledge acquisition, while others are predicated on the learner's capacity to acquire new knowledge in a problem-based, free-ranging and information-rich environment. The flexibility provided by online learning implies that the pacing can also be controlled or determined by the learner.

The particular technological tools chosen for delivery influence 'pacing', with the focus moving from print-based delivery at one end of the continuum, to a focus on interactivity at the other.

Criteria

The criteria used in the construction of online teaching/learning are a hybrid of intersecting pressures. Policy initiatives, competitiveness, the interaction or otherwise of teachers, designers and curriculum experts, all influence the selection of the criteria on which the courses and teacher/learner experiences are based. These are often very different criteria from those used to construct face-to-face teaching/learning experiences and the hard-copy materials used in flexible delivery.

Control

The 'control over the social base which makes this transmission possible' (Bernstein 1996, p.27) represents the pressure of government initiatives and large buckets of funding at one end of the continuum, to the individual's ability to flick a switch at the other.

Constructing the framework

The previous analysis has shown that the relative roles of the teacher, the learner, and the context, ebb and flow in response to myriad gravitational pulls. In this 'disintermediated' environment, the roles appear fractured when compared with more traditional forms of VET delivery. The resulting pedagogies are disparate and by definition developmental. Online pedagogy is multi-dimensional.

Ailwood et al. (2000, p.2) have built on the Bernstein framework and their extensive Australian study supports a 'multi dimensional model of classroom practices', where the complexities of student and teacher populations interacting with content have been mapped and conceptualised into a framework which richly describes and accommodates these complexities. This has led to the development of the concept of 'productive pedagogies'.

> [Productive pedagogies] provide a framework and a language by which educators can describe and discuss classroom practices. It is not an exhaustive list of pedagogical practice but a discussion starter and a window into the usually private space of teachers' work.
>
> (Ailwood et al. 2000, pp.19–20)

The four dimensions of 'productive pedagogies' are: 'intellectual quality, relevance, supportive classroom environment and recognition of difference' (Ailwood et al. 2000).

The first of these establishes the principle 'that a focus on high quality is necessary for all students to perform academically' (Ailwood et al. 2000, p.11). Relevance refers to the way in which the knowledge that is presented is integrated or related to another body of knowledge or experience. The ideal of a supportive classroom environment is based on extensive research and introduces the concept 'that students require a supportive classroom environment if they are to achieve what teachers ask of them' (Ailwood et al. 2000, p.13). The fourth dimension of the productive pedagogies paradigm is concerned with the recognition of difference and how this difference is acknowledged through language, narrative and text type.

Each of the dimensions of effective pedagogy generates a set of questions that can be used to interrogate available data and current practice. These questions appear in appendix 6.

Although this framework was developed specifically for schools, it is equally applicable to an analysis of pedagogical practices online and has the capacity to provide a clear picture of what is happening currently and to offer directions for future change.

An initial framework

The literature review, particularly the pedagogical frameworks identified from the literature, and the interviews, generated a long list of attributes of online pedagogy which work effectively in specific circumstances using different technologies and engaging a range of learners. They also reflected a growing sophistication in thinking about the ways in which the individual elements of pedagogy contribute to effective online learning. The meta-evaluation of the literature and the interviews have extended this thinking and have provided a set of themes across a range of studies.

The defining criteria that have been used to generate these themes are:

- the frequency of their occurrence within the literature
- the extent to which the existing research has approached the topic in a holistic way leading to generalisations
- the level of synthesis provided by the interviews
- the extent to which they fit within the concepts of 'framing' and the elements of 'productive pedagogies' (Bernstein 1996; Ailwood et al. 2000).

The following is the initial list of online pedagogical effectiveness indicators. They are grouped thematically to provide an initial framework for discussion and comment. Pedagogical effectiveness in an online environment is indicated by:

- a learner-centred environment
- constructivist approaches to teaching and learning (approaches enabling learners to build new knowledge and skills based on those they already have)
- high-quality materials design
- teaching and learning strategies that develop cognitive skills
- high levels of interactivity between all participants
- guaranteed and reliable forms of access to the technology
- quick and easy access to the technology and the particular site of online learning
- engagement with the online materials
- learning experiences that encourage synthesis and analysis

- opportunities for 'deep learning'
- consistent levels of feedback
- thoughtful matches between materials, learning styles and learning contexts
- a model of delivery which includes thorough planning, monitoring, reviewing and evaluating of course materials and student progress
- a range of available navigational choices for students
- teachers who are imaginative, flexible, technologically gymnastic, committed, responsive and expert communicators
- a different treatment of content at various levels of sophistication, depending on the prior knowledge of the learner
- appropriate feedback and opportunities for review and self-testing
- shortcuts for those who are short of time or who are already competent.

The literature reviewed and interviews conducted indicate that there are no absolutes in getting the 'right mix' of these indicators to guarantee effective learning. The realities of online teaching and learning acknowledge that there is a continuum along which teachers and students are located at any one time, and it is the complex interaction of these which defines the current pedagogy.

The initial framework described below collects these indicators, groups them into themes and provides a way of mapping current practice. The framework has been informed to some extent by the theoretical principles of effective pedagogy suggested by Bernstein (1996) and Ailwood et al. (2000).

The initial framework was circulated to the members of the reference group, the people who have been interviewed for the study, a wider audience of critical friends and was the subject of a symposium presented at the NCVER No Frills Conference (2000). The feedback was used to modify the framework.

Explaining the framework

The realities of online teaching and learning acknowledge that there are a number of continua along which teachers and learners are located at any one time, and it is the complex interaction of these that define effective pedagogy. Figure 2 sets out these continua diagramatically.

Levels of guidance

Axis 1 shows how the needs of the learner influence content and the forms of delivery. This continuum extends from the new 'dependent' learner who is focussed on discrete pieces of content to the 'independent' highly self-directed learner who constructs their own learning and search for meaning. It acknowledges that factors such as learner background, learning styles and preferences, literacy levels, cultural and social background and self-efficacy will influence the types of online delivery that are likely to be effective along the continuum. It also recognises the different purposes of learning and teaching and the fact that different types of knowledge demand different forms of online delivery.

Experience of learning

Axis 2 plots levels of self-management and the levels of guidance that students require. It extends from those 'novice' learners who require extensive guidance and support to those 'expert' learners who have high degrees of readiness, autonomy, motivation and other skills that equip them for self-

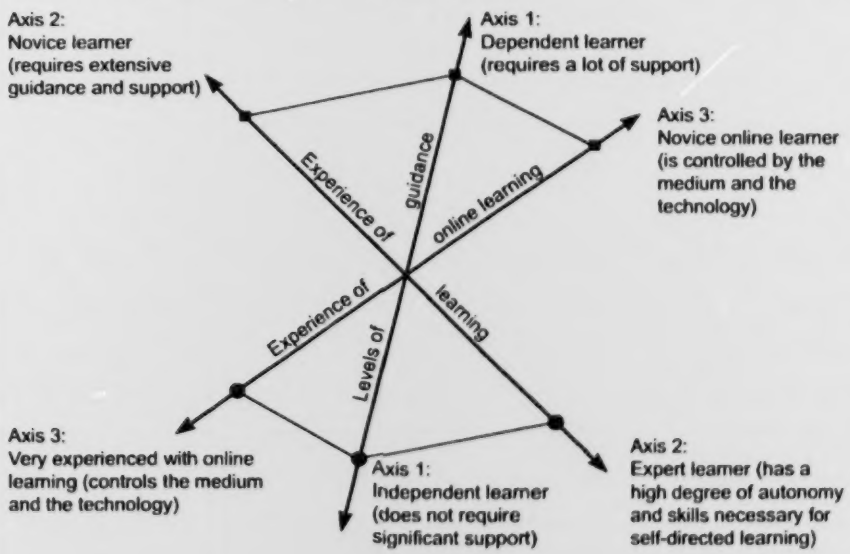
directed learning. It takes into account the relative levels of critical literacy, procedural knowledge, meta-cognitive awareness and the learner's understanding of their own ways of learning.

Supervision of online learning

Axis 3 plots the continuum of experience with learning in an online environment. It shows the relative 'control' over the medium that both the learner and teacher have. The greater the degree of control by teachers and learners, the more pedagogy can change and become flexible to accommodate this experience.

In an ideal world the axes intersect and there is a concurrence between teacher and student skills, knowledge, experience and control. The online world is less than ideal, and the literature, experts, policy-makers, managers, teachers and students define pedagogies for sets of learners, teachers and circumstances at various points along the three axes through a process of explicit linking. It is true that, in all teaching and learning situations, there are distances between teachers and learners. However, in an online environment these distances are stretched, and the range of abilities, predispositions, styles and preferences displayed by both teachers and learners and overlaid by course design, mean that the matches between content, delivery style and learning effectiveness are more divergent than convergent. The diagram is a picture of the best and the worst of online pedagogy as it is currently constructed and a map for the development of more effective teaching and learning.

Figure 2: Some dimensions of online pedagogy



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Overview of findings

This study has confirmed some of the existing evidence about the pedagogy of the online delivery of VET. It has also provided new evidence about online pedagogy by bringing together a variety of snapshots from the perspectives of teachers, students and course materials. The new evidence has settled some questions and posed many more.

The views of a number of experts are summarised below and in appendix 1. Findings from the workshops are presented in appendix 2 and both these sources of information have been used to inform the pedagogical effectiveness indicators presented in the previous chapter. In addition, survey information has been gathered from both teachers (appendix 3) and students (appendix 4). Appendix 5 reports on the analysis of a range of real courses. This analysis has covered the technologies used to deliver content, the self-management skills learners needed to persist in the course, the assumptions made about the learners and the levels of interactivity available. The courses were also rated in relation to the pedagogical effectiveness indicators which the project has established and validated. Finally (in appendix 6) the pedagogy of online learning has been evaluated using Ailwood et al.'s productive pedagogies framework (Ailwood et al. 2000).

Views from the literature and the experts

The literature review for the study demonstrated that the subject of online pedagogy is complex and multifaceted. For this reason it is important to capture the voices of those working in and using the online environment in a number of capacities.

The range of experts interviewed explored the range of pedagogical assumptions underlying online delivery, noting that these were made about:

- the nature of learners and the learning process, and their control over it
- the 'art' of teaching and the extent to which competent traditional teachers could transfer and use their skills in the online environment
- whether or not teachers were needed at all
- access issues for learners
- the balance between, and relative importance of informal and formal learning
- whether comprehensive new online learning approaches were sustainable after introduction.

The literature review, the expert opinion (appendix 1) and the workshops (appendix 2) all helped to produce the pedagogical effectiveness indicators presented in the previous chapter of this report. This research project has demonstrated that there are a number of indicators of pedagogical effectiveness that are clearly expressed by all stakeholders involved in the online delivery of VET.

Nevertheless, the research has also shown that pedagogical practice rarely conforms to these principles. The experts interviewed agreed that current practice is underpinned by a range of assumptions that, however valid, are not matched by teacher capacity, student ability, course design and content. The dominating influence of the technology has created assumptions about the nature

of learning, the role of the teacher and the student characteristics, and these are poorly matched with teacher and learner expectations. This becomes particularly clear when the data from appendices 2 to 5 are examined.

The participants in the workshops (see appendix 2) were both experienced and highly contributory. The discussions of the research questions typically covered a wide set of topics directly and indirectly related to the online pedagogy of VET delivery.

Views from practitioners and students

All the participants in the workshops (appendix 2) recognised the potential for online delivery of VET to make a difference to the flexibility and effectiveness of student learning. They considered that the pedagogical assumptions which underpin effective online delivery included factors relating to levels of teacher and student independence, enthusiasm and a commitment to inclusivity. However, they identified that current pedagogy is constrained by pressures from 'outside', such as the rapid pace of change, external design of materials and limited opportunities for teacher reflection. The participants agreed that some content areas are more suited to online delivery than others, and that student and teacher familiarity with the technology was a critical determinant of effectiveness.

The teaching and learning areas that are most suited to online learning in VET were influenced by factors such as student and teacher expectations, levels of content complexity and the flexibility of entry arrangements into courses.

Participants in the workshops agreed that the teaching and learning styles which facilitate online learning focus on independent learning, problem-based learning, and constructivist learning. The characteristics of effective online teachers and learners include flexibility, high levels of intrinsic motivation, persistence and technological and literacy skills.

The interactions at the individual learner level that promote effective learning in online VET include collaborative activities, sustained contact, the development of relationships and high levels of course content organisation.

Participants in the workshops agreed that online pedagogy has entailed new skills and roles for teachers and learners. It is not simply a matter of transferring face-to-face practice into a new environment. In particular, the issues of teacher accountability, the reconceptualisation of assessment and new levels of technological and communication skills were considered critical. Participants were less sure about what constituted world's best practice online, and commented on the need to adopt a hybrid approach to delivery which is holistic and supported by constantly updated resources.

The workshops confirmed that online pedagogy is a difficult topic to address and that the day-to-day practices of teachers are disparate and not altogether satisfying. Participants identified the pedagogical potential of online delivery, supported its development and clearly recognised areas for change and improvement.

The workshops confirmed the validity of the pedagogical effectiveness indicators. Participants modified the language and emphasis, leaving the intent unchanged. They also reinforced the usefulness of applying a research-based theoretical framework to the complexities of online pedagogy. The range and depth of discussion about the factors influencing online delivery, the effects on teachers and learners, and the multiple perspectives on the different dimensions of online pedagogy underpin the application of the productive pedagogies framework to the project data.

The teachers' survey (see appendix 3) gathered information about teacher and course characteristics, the teaching behaviours they used, information about their roles, skills and the necessary changes to

their teaching approaches. This information was complemented by information collected from students (see appendix 4), including their experience of online learning, their perceived skill needs to be a competent online learner. The analysis of both the teacher and student questionnaire results can be summarised as follows.

- Students and teachers agreed that web-based course content and email were used most often to facilitate learning.
- Students felt that the features of effective pedagogy are 'sometimes' characteristic of their learning. Teachers felt much more strongly that these features characterised their online teaching behaviour, although the strategies they used did not always support this commitment.
- Students and teachers disagreed about the extent to which building online relationships was part of their experience. Teachers maintained that the behaviours which they used online did this far more effectively than students reported.
- Teachers reported that they could cater for students' learning preferences and styles 'sometimes/usually'. The student responses confirmed this report.
- The student and teacher free responses to questions about the match between online learning and student learning styles and preferences indicated that teachers clearly appreciated the range of opinions that students held about the suitability of the medium for effective learning.
- Teachers and students agreed that online teaching is 'fairly suitable' to the specific subject area. The teacher and student issues raised to support the ranking showed a remarkable equivalence. Both groups surveyed recognised that, where content and delivery method were complementary, as with information technology, suitability increased. In the case of complex concepts or discussion-based and values-oriented content, face-to-face communication and interaction does not transfer well to an online environment.
- Teachers and students agreed that online delivery had led to the acquisition of new skills. The teacher skills were more strongly clustered around using the technology than was the case with the students. Both survey groups recognised the importance of developing personal/affective skills to cope with the sometimes frustrating idiosyncrasies of the technology.
- Students' descriptions of their new roles were both positive and negative. Teachers' responses were more focussed on the possibilities for facilitating, motivating, mentoring and guiding students' learning. However 'inexperienced' or 'average' teachers were decidedly less enthusiastic and expressed feelings of frustration at their apparently deprofessionalised status.
- Both teachers and students agreed that a mixture of online and face-to-face teaching was the ideal as it allowed for both flexibility and communication.

From the review of the online courses (appendix 5), it is clear that text-based delivery dominated and that this type of delivery made significant assumptions about the nature of the students enrolled in them. In relation to the pedagogical effectiveness indicators, they were strongest in the following key features:

- The course encourages an engagement with the online materials.
- The course is characterised by high-quality materials design.
- The course offers shortcuts for those who are time-poor or already competent.
- The course creates a learner-centred environment.

They appeared weakest in relation to:

- The learning experiences embedded in the course encourage synthesis and analysis.
- The course creates opportunities for 'deep learning'.
- The course uses constructivist approaches to teaching and learning.
- The course encourages high levels of interactivity among participants.

The qualitative data analysis based on the productive pedagogies framework (appendix 6) suggests that if online pedagogy is to become more 'productive' and effective for VET students, all the dimensions of pedagogy need to be addressed in the design and delivery of online materials. In particular:

- The cultural dimensions of learning require attention.
- The capacity of the online environment to cater for and build on cultural difference in an inclusive way needs to be embedded into delivery.
- The online environment must develop pedagogies that value difference and that begin with valuing the student knowledge base.
- The transference of strategies to include students with disabilities in online learning is an issue that requires will and talent.
- The critical skills of information and functional literacy need to be accepted as integral parts of online pedagogy.
- The social dimensions of learning and the encouragement of democratic learning practices require detailed attention in this environment.

Discussion

The findings of the study generated a number of issues for consideration and discussion, all of which impact on current online delivery as well as having implications for future policy development and practice in this area. As before, the focus for the discussion of the issues is informed by the research questions.

Pedagogical assumptions underlying online delivery of training

The data for this project were collected in different forms from across Australia. The quantitative data came from teachers and students in four states and one territory located in a mixture of rural, remote and urban contexts. The qualitative data came predominantly from two states and one territory, although the interviews were conducted Australia-wide, and the courses analysed were being delivered nationally and internationally.

The individual focus implicit in a great deal of online pedagogy, while ostensibly conforming to learner-centred practices, may not do so and in fact, may represent a backwards step. Learning is a social activity as well as a cognitive one, and unless this 'sociability' is guaranteed by online materials, only the most motivated students will persist.

Pedagogical principles remain but practice is quite different. It is not simply a matter of transferring skills across. The discourse of the online experience is quite different for both teachers and learners. New genres, protocols for language and expression, new scanning strategies, attention spans and reading skills are required, particularly for learners who may be very used to the dynamics of face-to-face delivery.

There is a high degree of disharmony in the pedagogical assumptions made by the various participants in the online delivery of VET. The dominating influence of the technology has created assumptions about the nature of learning, the role of the teacher and the student characteristics which are poorly matched with teacher and learner expectations. Teachers are holding firmly to the sound principles of pedagogy and students are reiterating the importance of these. Communication, interactivity and the development of social cohesion are regarded as laudable goals in an environment which frequently militates against their achievement. Teachers are not only struggling with the technology, but also with an often unfriendly teaching context where the principles of sound pedagogy conflict with course design and the realities of an isolation created between teacher and learner. It is a credit to teacher professionalism and dogged persistence that online delivery works as well as it does.

The pedagogical assumptions made about the learner in an online environment are currently based on the transmission of information. Teachers and informants recognise that effective online practice has to move beyond this model. If this movement is encouraged and if the resources are available to create more interactive learning experiences, then the pedagogical assumptions become even more complex. Learners are assumed to have independent learning styles and possess high levels of critical information literacy. They must have high levels of persistence as well as language, literacy and numeracy skills that match the demands of the medium. The learners must also be self-regulated and self-motivated and confident with the medium itself. The assumption is made that the

materials and the teacher input will cater to their particular learning styles and preferences through the provision of constructivist and experiential materials.

In the majority of cases, the teachers in this project felt that they were focussing on the features of pedagogical effectiveness in their online teaching practice. However, these aspirations did not match the current practices that they were using and this gap is reflected in their comments about the frustrations involved in being an online teacher. When their aspirations are placed beside the actual teaching strategies used, investigation and research and interactivity are characteristic of their teaching for about 50% of their time. Practice and repetition were also important aspects of their teaching. Teacher behaviour and educational commitment were therefore not easily translated into the online learning experience for their students.

The reasons for this gap between aspiration and reality were explored by other informants. The need for a coherent pedagogy was recognised as crucial, but a number of obstacles were simultaneously recognised. These included the rapid acceleration of change in the technology itself which frequently left both teachers and students behind. The dominance of the 'Bill Gates pedagogy' where: 'you don't have to be best just first' intersects with the exigencies of a highly competitive VET sector, forcing teachers to move into pedagogies with little time for reflection on or evaluation of their practices. Other participants felt that they had lost their pedagogical control and that their sense of their own teaching practice was now subjugated to the design of materials and courses into which they had little input. Online pedagogy was being framed by the software and then consolidated by the exigencies of time. Casualisation of the teaching staff also contributed to the acceptance of less than pedagogically satisfying materials. Moreover, while participants agreed with the list of indicators of pedagogical effectiveness and could articulate their support for these, they questioned their capacity to deliver the practices that matched their commitment.

The students involved mostly described themselves as competent and experienced computer users and were positive about these experiences. In the majority of cases these students identified that the features of effective pedagogy outlined earlier were only 'sometimes' characteristic of their learning. It is significant to notice that, despite teacher commitment and enthusiasm, only 58% of students reported that the building of relationships online was 'always' or 'usually' part of their experience.

In summary, the topic of the pedagogical assumptions that underlie online delivery of training are complex, multifaceted and influenced by the roles of those discussing the topic. Teachers have aspirations that are often not realised, and students recognise that the prerequisites for success have more to do with persistence and independence than with anything intrinsic to the medium itself. The reasons for the gaps between understood good pedagogical practice and the realities of online delivery relate to time management, workplace arrangements, materials design and the rapidity of change, all of which often leave teachers deprofessionalised.

The suitability of teaching and learning areas to online delivery of VET

There was general consensus that 'suitability' for online delivery was a relative judgement. Online delivery could provide access to learners in situations where previously this had not been possible. Furthermore, online technology offered learners the flexibility in their learning context, a situation which was appealing to those who worked, or who for other reasons, found formal class contact difficult.

In areas where the mode of delivery and the content area were very similar, such as information technology, online delivery became an effective form of workplace training. By contrast, teaching and learning areas that required practical tasks or where the processes of communication, critical thinking and values clarification were central to the subject area, such as that of welfare, were unsuitable, given the present state of technology.

In spite of the superficial attractiveness of online delivery in a competency-based (CBT) framework, a range of other factors had to be considered in making judgements about its suitability. These

variables included considerations about learning styles and preferences, the competence and confidence of the learners and the importance of the social dimensions of learning.

The courses make unequivocal assumptions about learner characteristics and traits, and unless these are matched to the skills and attributed of the learners, suitability becomes a problematic area.

In the present environment, suitability is more likely to be achieved in a situation where online learning, content and face-to-face contact are 'blended' to suit both the circumstances and levels of resource provision.

The limitations of online assessment also impact on judgements of suitability.

Teaching and learning styles that facilitate effective online delivery

Teachers require time to enable them to facilitate online delivery effectively. Currently, online delivery is often seen as another overlay on an already cramped workload. Teaching styles which facilitate effective online delivery are attributable largely to the attitude and personality of the teacher but, understandably, the misapprehension that the acquisition of technical proficiency will guarantee sound teaching practice still prevails.

Both teachers and students preferred a 'blended learning' approach that captured the best features of flexibility and mixed these with the social interactions of the classroom. When courses were fully online, then opportunities for induction, orientation and training were critical to student success and teacher satisfaction.

Effective interactions at individual learner level

Interactivity was unequivocally regarded as the most effective teacher–student interaction. This consisted of:

- consistent feedback
- communication
- clear guidance and a sense of course/module organisation.

Teachers regarded 'interactivity' in a quite specific and often limited way and the use of the medium to encourage more critical thinking through debate and discussion was a relatively untapped strategy. Problem-solving, investigation and research, and the pursuit of theoretical understanding were regarded as contributing to effective online learning at the individual level.

New roles and skills of online teachers and learners

The roles and skills of teachers and learners are different in degree, depending on whether the online delivery supplements classroom time or replaces it. However, in both cases, new definitions of time and work patterns are required. New technological and facilitation skills and experience are needed as teachers make the transition. There are new rules for interaction, security and privacy to be learnt and codified. Teachers have to institute new management practices and students have to manage their time in a highly self-regulated way. The price of flexibility is work re-organisation for teachers and effective self-management skills for students.

The literary demands imposed by many online courses and modules as well as the cultural homogeneity characterising many of them, raises questions about the ability of the skills of students from a non-English-speaking background and Aboriginal and Torres Strait Islander groups to undertake online learning. During the project, teachers and students generated lists of skills they considered essential for effective online learning and students from these two groups may not come to an online course possessing all or some of them. Fundamental issues such as the cultural appropriateness of questioning, conversational conventions, language acuity and student attitudes

towards interaction with authority take on a heightened importance in an online environment. The possibility exists that the new skills and roles required may in fact be antithetical to the culture from which these students come. In traditional Indigenous culture for instance, knowledge is transmitted verbally, obviously in direct opposition to current online practice. In classrooms, diversity is an asset. In an online environment it may be a distinct disadvantage.

The new roles and skills for the online teacher come from attitudinal predispositions. Qualities such as perception, compassion, collaboration and creativity are considered essential prerequisites for online delivery success. These attitudes are the initial building blocks from which teachers develop new facilitation, motivational, mentoring and guiding roles and skills. Communication is profoundly different online where teachers are concentrating on clarity and regularity. Constructivist approaches to teaching and learning entail new teacher roles and skills and the idea of the 'flexible facilitator' is encouraged by courses that are commercially or centrally designed.

Pedagogical features and world's best practice

This was the least clear set of results. There seemed to be a reluctance to commit to principles of world's best practice and perhaps this is explained by the relative youth of this phase of technology and the shortage of rigorous evaluation in the area.

However, by applying the productive pedagogy framework to the data, it was possible to measure the gaps that have to be closed between current practice and extant knowledge of how learning can be best facilitated. Online delivery of VET is a relatively recent innovation and this research shows that, in spite of teacher effort, professional development and high levels of technical resourcing, there are some startling distances between its pedagogical features and world's best educational practice.

Issues for further consideration and research

The research findings have shown that, in terms of what we know about the factors contributing to effective student learning, online pedagogy needs to address *all* of the dimensions of practice. In particular, online pedagogy needs to be able to create teaching and learning environments where students have the opportunity to:

- reduce their reliance on text
- explore and value their intellectual, social and cultural backgrounds
- develop their knowledge beyond the transmission and assessment of content
- reflect on their own learning
- be part of an inclusive learning environment
- communicate extensively both with their peers and their teachers
- become self-regulated and engaged with their own learning
- develop a group identity that connects them with their learning and the broader social environment.

This project has demonstrated that all of the dimensions of effective pedagogy require further evaluation and research. In particular, there are some crucial questions and which require thoughtful attention and well-researched answers:

- How can online delivery of VET be made more socially and culturally inclusive?
- If the key competencies and communication skills are considered to be integral to the successful implementation of training packages, what can be done about addressing these more explicitly and effectively in an online environment? In particular, 'working in teams', 'communication' and cultural awareness' raise questions beyond the scope of this study.

- How can the models for course design be broadened to give teachers a more active and professional role in the construction of online materials?
- Assessment beyond the summative and frequently simplistic strategies that are embedded in current online pedagogy requires a great deal of attention. Assessment does not match the striving for high-quality course content and sound instructional design.

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One size doesn't fit all

Pedagogy in the online environment – Volume 2

Roslin Brennan

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Australian *Flexible* Learning Framework
Supporting Flexible Learning Opportunities

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Publisher's note

This report is published in two volumes: volume 1 contains the main report, while volume 2 contains the appendices. Volume 2 can be found on NCVER's website <www.ncver.edu.au>.

Background

In August 1999, the Australian National Training Authority chief executive officers endorsed the *Australian Flexible Learning Framework for the National Vocational Education and Training System 2000–2004*. The Australian Flexible Learning Framework has been developed by the Flexible Learning Advisory Group and represents a strategic plan for the five-year national project allocation for flexible learning. It is designed to support both accelerated take-up of flexible learning modes and to position Australian vocational education and training as a world leader in applying new technologies to vocational education products and services.

An initiative of the Australian Flexible Learning Framework for the National Vocational Education and Training System 2000–2004

Managed by the Flexible Learning Advisory Group on behalf of the Commonwealth, all states and territories in conjunction with ANTA.

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Appendix 1: Interviews with policy-makers, practitioners and online learning managers

The literature review for this study demonstrated that the subject of online pedagogy is complex and multifaceted. For this reason it was important to capture the voices of a variety of people working in the online environment in a range of different capacities. Their reactions to the research questions and the general topic of pedagogical effectiveness informed the development of the pedagogical effectiveness indicators that began with the literature review, clarified the focus areas for the questionnaire and contributed to the development of the working framework.

The discussions of online pedagogy with the interviewees (For a list of interviewees see the chapter describing the methodology adopted for the project in volume 1.) and the propositions they advanced are presented in this section of the report. The interviewees were asked to comment on the research questions.

The excerpts from the interviews which appear in this section are illustrative of the issues that emerged from the discussions.

As noted in volume 1 of this report, the interviews were conducted with policy-makers, practitioners, curriculum designers and managers, all of whom were involved in one way or another in online delivery of VET.

Interview results

What pedagogical assumptions underlie online delivery of education and training?

The participants agreed that there is a range of underpinning assumptions underlying pedagogy in an online environment. The extent to which these principles are either explicit or clear was a question of contention, with some participants maintaining that the lack of definition and agreement between the sectors involved in online support and delivery contributed to an incoherent pedagogy. They regarded online pedagogy as an area where materials are designed and delivered before sufficient research analysis of needs has been undertaken. They also agreed that this question is not often explored and that there is a need to 'get under the practice' to assess the validity of policy decisions being made.

The issue of what constitutes real pedagogical practice is further complicated by the different modes of online delivery of education and training and the consequent differences in pedagogy which accompany these. The gap between the 'idea and the reality' creates a lot of unclear thinking and ineffective practice. Reporting from a project and policy position which he saw as very different from that of the practitioner or student, one of the participants summarised this confusion in the following way:

> There are definitely two forms of online delivery: the formal—the new form of distance education and the delivery of resources online on the assumption that instruction occurs at the recipient point rather than the sending point. The sets of assumptions are quite different and the issues are quite different and in the discussions, the two forms are interchanged and sometimes muddled. Dealing with the first one there is in Australia generally, a good deal of

> fuzziness and confusion to do with issues relating to pedagogy. Often in policy documents we make assumptions about pedagogy and they are carried by the kind of 'secret garden' language of the cabal that runs things. There are words like 'constructivism' and a whole set of language which policy-makers use and wish characterised pedagogy.
>
> In fact most of those things don't characterise pedagogy. Equally in the online environment I think there is a wish to enact that same set of assumptions … the reform assumptions about pedagogy and it is extraordinarily rarely done, in the online environment even more perhaps than in the traditional delivery modes. There is a disjunction between the reform pedagogy assumptions that policy-makers hold and what actually happens. And it is not surprising because in the online environment it is shockingly difficult to get beyond transmission.

The participants discussed the issue of online pedagogical assumptions and the following section represents their contributions to 'getting under the practice'. They discussed assumptions about:

- the learner and their skills
- the 'art' of teaching
- formal and informal learning
- learner control
- the role of the teacher
- sustainability.

Assumptions about the learners

Participants felt that the online learner is assumed to have a degree of independence about their own learning which equips them to be persistent and consistent learners. Learners are assumed to be comfortable and confident with the medium.

> Online assumes that people are self-motivated and self-regulated learners and that what they need is assistance in structuring their learning rather than just taking it in.

Some interviewees felt that online pedagogy should be based on principles of adult learning, experiential learning and discovery learning. These principles should form the basis of a coherent online pedagogy. The extent to which practice matches expectation is a matter for scrutiny and evaluation. It is also assumed that learners have the higher-order cognitive skills and processes that equip them to navigate and construct meaning for themselves. Literacy and numeracy skills are also assumed. Since the medium is often print-based and instructions are generally given in words, learners must have adequate skills to allow them to process the information quickly and accurately.

Learners must be good 'comprehenders' and be able to skim and skate across information easily. It is also assumed that their levels of critical information literacy allow them to make judgements about the relative value of information accessible on the internet. This is particularly relevant when the assumptions behind the learning activities are constructivist rather than transmission-oriented. It is also assumed that the learners' preferences and styles match well with the demands of the online environment. People need different kinds of guidance and support at different stages of their learning.

Summary

The participants interviewed commented on the difficulties involved in moving beyond the principles and practices of transmission pedagogy in an online environment. The proliferation of the forms of online delivery and support for learners has introduced an incoherent set of ideas and practices. In contrast to this, participants identified the pedagogical assumptions that underlie sound teaching and learning practice. The assumptions in relation to the learner are as follows:

- They have independent learning styles.
- They possess high levels of critical information literacy.
- They have strong levels of persistence.
- Learner styles and preferences are catered for.
- Literacy and numeracy skills match the demands of the medium.
- Learning should be experiential and constructivist.
- Online learners are self-regulated and self-motivated.
- Online learners are confident with the medium.

The art of teaching

Participants felt that the online environment is a very different teaching and learning context, requiring particular and new skills. The speed of change and the consequent lack of time for teacher reflection has militated against the 'quantification of the science' of teaching.

> It is fundamentally important that we understand that there is an art to delivering learning experiences online. Teaching skills are fundamentally important in VET. There is a commitment to have pedagogical underpinnings in CBT [competency-based training] and we need to know best how to facilitate people's learning in this environment.

Participants acknowledged that the acceptance of the idea that online pedagogy is an art is slowly emerging and that the process of identifying underlying pedagogical assumptions is an evolutionary one.

> We started off with a basis that this was just distance education which largely in the past had been print-based. This does not sufficiently use or exploit the technology. This is the way we began but it is not a good way of using the technology. All it does is deliver the printed word in a different format.
>
> If pedagogy is the art of understanding learners and the learning process and continually trying to find ways of providing experiences and information and support that continually help people to learn then intuition, sensitivity and care are qualities of teaching practice. These ought to be the assumptions that underpin effective online delivery.

The following reflect the pedagogical assumptions that underlie the 'art of teaching' online:

- Teaching practice is underpinned by intuition, sensitivity and care.
- New skills are required.
- Speed of technological change will be accommodated.
- Online teaching takes place in a competency-based training framework

Assumptions about access

Participants reported that the access and opportunities created by the new technologies are both attractive and overwhelming. Sometimes the features of the technology are so intimidating that the principles of effective teaching are dissipated. The pedagogy is characterised by a range of potentialities which are not yet tested or systematically evaluated. As a participant commented:

> One of the assumptions is that the technology is providing access to heaps of people who haven't had access so there is a bureaucratic driver sitting in the background which says we have the internet we should be able to use it to provide learning to people who cannot get to their formal classes. People are not really thinking about what they are doing; they are just thinking they can put it up on a website and if there is a chat room then I could use the chat room to encourage some kind of social interaction between people. Maybe it's going to open

> up new ways in which my students can interact with one another. People sit down and try and look at what they are currently doing and try and plug it into what is available technologically without thinking too much about what they as a person and their students actually prefer to be doing.

The list below sets out the online pedagogical assumptions that participants felt related to access:

- There is a variety of technologies available to be used.
- Students are being provided with unlimited opportunities.
- Transferring print-based material to the web is equivalent to learning.
- Reflection and evaluation are limited.

Assumptions about transferable skills

A number of participants commented on the common pedagogical assumption that the skills developed by competent teachers in more traditional teaching and learning situations can be easily transferred to an online environment. A number felt that this was a misinterpretation of both the medium and its possibilities and accounted for some of the less effective current practice. By way of example, one of the interviewees described the development and provision of the Certificate IV in Adult and Community Education in Victoria.

The students in this course were part-time teachers geographically spread across the state. In terms of their abilities and enthusiasm for learning, they were an ideal audience for online delivery. The following description highlights the ways in the skills traditionally contributing to effective pedagogy do not always match the pedagogical skills required for successful online delivery.

> The process of putting the materials online went from using one of the expert deliverers with sound teaching practices behind them … but it didn't work. Then we used a librarian to design the materials and that didn't work either. Then we found a person who could publish things with graphics and a nice chatty style and who knew what it was like to be totally isolated and the kinds of weird questions that people ask and who could try and understand the processes from the learner's perspective.

> It comes down to the fact that because someone is a great classroom teacher, people say they have the ability to transfer these skills to an online environment. There are a whole new breed of people who have desktop publishing skills that can make things interesting and fun. It is a whole new style of producing and delivering material to the style of that which has characterised being brought up in the education sector.

The participants felt that general classroom educator does not necessarily have those sorts of skills or predispositions.

The following are pedagogical assumptions about transferable skills:

- New skills are required for materials design online.
- New styles of production and delivery can, and are, being used.
- Teachers can move from a face-to-face or a distance education environment to online easily.
- Students who regard themselves as competent information technology users can move to formal online learning easily.

Assumptions about formal and informal learning

Some of the people interviewed felt that online delivery is based on the assumption that the formal aspects of learning are pre-eminently important. In some aspects, despite its capacity to

communicate, the application of technology to learning has isolated learners from the informal dimensions of their own learning. This is particularly the case in adult and community education.

> A lot of the informal dimensions of learning are discounted by the medium and what a lot of adult learners crave is the contact with others with whom they can share the flow-on effects of their new learning. Organising child care, sharing a casserole and talking about the impact of their learning on their personal and family relationships are crucial aspects of adult education. For those returning to learning in this situation, the traditional lack of threat and the high level of social interaction have been the jumping-off blocks to confidence and then progress into more formal accredited education and training.
>
> This informal dimension of the technology needs attention. The potential has not been adequately explored and a lot of students are sorting these arrangements for themselves technologically. No real system is helping them to do this. There is a need for interaction, not materials produced electronically. The preference is still for real contact between learners.

The assumption that we need to meet the personal and social needs of the learner in discussions of online pedagogy was reiterated.

> In some ways the technology has created bigger distances between learners as it is seen as a solution. We can produce the cocoon of learning and you need never move beyond your screen. Replicating experiences and realities when they all exist out there. We just have isolated tutors who are pumping out a whole lot of stuff with no thought of where they live and what other resources sit around them that can be used to assist their learning. We need to design the levels of interaction so that they are manageable—to break students into smaller groups and ask for collective responses and actually shared communication. The chat group approach is one that you can clearly take.
>
> Most online materials at the moment are driven from a publishing or a broadcasting perspective. They do not have the sophisticated approaches that you would expect to happen in a classroom. Being able to break students and then reform them into whole group at my discretion and on the basis of my good judgement is not available. That kind of dynamic communication capacity is just not present in the learning products that you tend to see around.
>
> Where people are moving from text-based delivery towards the inclusion of audiovisual is reflective of the way you see things being delivered on broadcast television, rather than presentations or interactions that are enhanced by the addition of vision or sound.

One participant mentioned that a facet of pedagogy embedded into sound practice is the capacity for experimentation by making 'mistakes'—by learning in ways beyond the simple tick/flick and repeat of materials. The opportunities for students to experiment and get things wrong is only just beginning in the online environment. This is particularly relevant to the types of assessment strategies used online.

Summary

Online pedagogy makes some assumptions about the balance between, and relative importance of, informal vs. formal learning. The following points illustrate these:

- The personal and social needs of the learner must be accommodated.
- Most current online materials are designed around publishing or broadcasting principles.
- Online dampens the student–teacher response level.
- Formal learning is pre-eminently important.
- Online delivery isolates learners from informal and social learning.
- Opportunities for successive approximations must be created.

Learner control

Research indicates that learners do not want to lose control over their own learning and they do not want to lose the social interaction embedded in informal learning. Eighty per cent of adult learning is incidental and non-formal and the online environment does not always acknowledge or build on this assumption. One interviewee commented that:

> The extent of learner control in an online environment is highly restricted and not always attractive. People are a lot more independent than this. There is a real danger in thinking that if they are not enrolled they are not learning. This is just not true and the nature of the medium mitigates *[sic]* against the sense of learning independence which is now available.

The idea was raised that there is a continuum of desired control over the learning that is taking place from the novice learner through to those who are assertive learners and who know exactly what they want and which pieces of material to select to achieve this learning.

> Perhaps what we need to be looking at are 'blended ' learning situations incorporating all the different learning modes that are now so wonderfully available.

Online pedagogy makes some assumptions about the degree of control learners have over their own learning. These are summarised below:

- ✧ Transmission model of delivery and assessment applies.
- ✧ Learner control is highly controlled in terms of sequencing and presentation.
- ✧ Offering navigational choices equates with greater learner control.

Assumptions about the teacher

There is an increasing gap between where the learners are, both physically and intellectually, and where the teachers and trainers are physically and intellectually. There is an increasing proliferation of all kinds of offerings which impacts on the way formal provision occurs.

In particular, some of the commercially produced resources and courses assume the absence of a teacher.

> The potential of online offerings to bypass the teacher altogether. And there are examples of some commercial products which explicitly seek to do that. We need to think about this a lot and we don't because there is this kind of holy view of teachers. It is a matter of being clear about the role of the teacher and of pedagogy. The social context of education really needs to be thought of in every situation but this is so much more the case in an online environment.

> The online environment seems so more engaging, interactive, pretty and attractive, and there are such ambitious hopes for what you can do online. However, we need to keep in mind that learning is a human interaction. There is something in the relationships between the teacher and the learner that you can't do away with just by clever technology.

This view of the centrality of teacher–student interaction in any conceptualisation of online pedagogy was challenged by one participant. The role of the teacher was seen as a stumbling block to the development of a more coherent online pedagogy.

> One of the assumptions is that we can't move teachers out of their existing comfort zone into a potentially dynamic teaching environment. In this process of change we are asking people to move from an existing pedagogy into a pedagogy which supports both an online and a traditional environment. The underpinning assumption is that this change needs to happen over a period of time and it needs to be fairly well supported. A lot of the techniques that have been used in the past have not worked very well. Students are looking for a much more dynamic and interactive approach to their education and training. A much more student-centred approach.

The online materials make varied pedagogical assumptions about the teacher as shown below.

- Some commercial products are 'teacher free'.
- There is an increasing gap between teachers and students.
- Relationships between teachers and students are crucial to effective learning.
- The teacher is absent.

Assumptions about sustainability

While most online materials are currently driven from a publishing or broadcasting perspective, the participants were adamant that students demand new services in new environments.

> There tends to be the assumption that one of the major objectives is to reach large numbers of people with the same kind of message but it is individualised instruction that students tend to want. They tend to want to have something delivered to them that is relevant to their particular needs. This takes you down the path of trying to find multiple pathways to deliver highly individualised learning. The kind of communication activity that tends to be generated can be overwhelming. Pedagogy and design principles tend to be unsustainable.

One participant recounted experiences associated with the NSW TAFE online project to illustrate how the technology creates assumptions about the sustainability of teacher practice.

> When we have engaged teachers in the development of interactive resources, their first inclination is to create resources that are highly interactive and stimulate a great deal of response from the students. The teachers believe quite rightly that this is good teaching practice; sound pedagogy. But the consequences of those designed approaches tend to be that the teachers get overwhelmed by the amount of communication that is generated. Teachers and trainers have shown signs of moving into a second phase of pedagogical practice which is actually to reduce the amount of interaction that is embedded.

The answer for these enthusiasts, is not simply to replicate what they understand as good face-to-face interaction by embedding communication strategies into the courses and resources, but to reinvent a pedagogy which suits the environment and the capacities of the teacher better.

The following are the essential elements of such a strategy as identified by the interviewees:

- high levels of interactivity
- multiple learning pathways
- reach large numbers of students
- high levels of interactivity.

What are the teaching and learning areas for which online delivery is best suited? For what areas is it not suited?

Participants felt that some discipline areas are ideally suited to fully online delivery. Information technology, administration and business are examples of these content areas. Other areas are partially suited and in these areas online delivery should complement other forms of presentation and interaction. Content that is heavily theoretical lends itself to online delivery. However, in subjects where there is a strong emphasis on practical skills and a necessity for on-the-job training, online delivery becomes difficult.

Ideally there should be nothing that cannot be taught online providing that we take advantage of the facilities and developments as they occur. However, the need for personal interaction and communication is strong and the mixture of online and face-to-face seemed to other respondents to be crucial if students were going to persist and complete their courses. Respondents identified a

number of issues relating to the suitability of content. These include learner styles and preferences, blended learning, continuum of content difficulty and issues relating to feedback to students.

Learner styles and preferences

Learner styles and preferences were seen as critical issues by the participants. The ability to respond to individual student learning needs in a timely and appropriate way did not always characterise online delivery of education and training. Student learning was compromised as a result. However, this criticism was not restricted to the online environment and a large number of traditional practices have been submitted to pedagogical scrutiny as a result of the discussions of online delivery and support for students and their learning.

> There are probably very few areas that it is not suited to. It is far more likely to be suited or not suited to the learning style of the student. If we are talking about VET where students are being required to demonstrate competence in the workplace or the simulated workplace, there are probably areas that need to have consolidation and time in actually practising those skills in an actual workplace. In initially learning skills, the idea of using virtual reality can probably do a lot in early development or some practice, or trying things that you couldn't actually do in real life.

> In terms of learning styles, considering how much research has been done over the years, it is amazing how little we take notice of the findings in terms of delivery of any form of education and training. Largely people sit and are talked to. It has been well and truly proved time and time again there is very little retention from that form of learning. An appropriate mix of learning opportunities needs to be given. The right mix will be the right mix for them. Students need to be able to access learning in a number of different ways, which do suit their learning styles.

One caveat to this is that some students have no explicit knowledge of their own learning styles and no adequate language to describe them. If they are physically removed from their teachers and trainers, this problem is exacerbated. There is a real need to help students understand their own learning styles and create learning opportunities for them based on these.

Blended learning

While content suitability is an issue in online delivery, a number of participants felt that this was secondary to the need to 'blend ' various opportunities for learning to maximise the experiences for learners.

> If we adopt a blended learning-type situation then there is no reason why certain parts of the learning cannot be online. The technology can facilitate and complement all forms of learning and all content. The issue is the mixture of modes that are used. If we use the available methodologies and make them into a type of clothing that suits the learner then we have succeeded. It has to be a process of mix and match.

In all facets of education and training most learning requires some kind of practical demonstration of capacity and competence. Therefore, a mixture or blend of modes of delivery and assessment is necessary.

> Online is very useful where the content expertise or the teaching expertise is scarce, where a particular student who wishes to study can have contact where previously this was not available. However, it is a two-dimensional medium at this point in time and it's two feet in front of your nose. This is not actually the way to experience all aspects of something.

In the VET sector this was felt to be particularly relevant. There is a view that competency-based training has reduced the complexity of learning by making competencies highly explicit at every level. The assumption is that competencies identified in this way, can be easily transmitted in an online environment.

> In training where the model used is competency-based, there is a superficial attractiveness to delivery online. It actually makes the delivery of training online appear easy. However what you can do is deliver resources online and the role of the teacher is to enrich the student and trainee understanding of concepts.

Continuum of learning difficulty

Participants felt that some subject areas where interaction is fundamental to the process of learning were not well suited to online delivery as it currently exists. The level of complexity of the material is also important. The more complex the concepts, the more difficult the delivery becomes using current pedagogy.

> Where the intellectual domain of the content is relatively robustly understood the more likely that you can do quite helpful stuff online rather than in areas where the content is less well understood and shared, or in areas where the content itself is secondary to the interaction that occurs.

Issues of feedback

> The young learners coming in the assumption that they are going to be highly independent, highly motivated and self-supporting is not supported. For these young people the need for pedagogical teaching is very clear. Highly structured, supportive role-modelling by the teacher.

There is still a lot of work to be done in exploring where the technology can in fact enhance the learning.

> Unless the technology is amplifying and adding to the current practice then I am not sure that there is value for money. It has great value in networking students but I would be very concerned if all we were doing was taking text books and putting them online. Its about providing opportunities that didn't exist in the past such as communication, linking with experts, linking with other students and knocking down the physical boundaries between students and their teachers and trainers.

Summary

The following list illustrates respondents' opinions about the factors influencing suitability of content for online delivery:

- level of complexity of materials being delivered
- level of student understanding of their own learning styles
- degree of interaction demanded by content
- capacity to respond to individual student needs
- age and maturity of the learners
- degree of blend of different modes of delivery
- degree of match between student learning styles and materials delivery.

What teaching and learning styles facilitate reflective online learning?

Reflective learning goes beyond the absorption of information to the embedding of the new information into existing learner knowledge. It involves the ability to critically analyse and synthesise new information so that it becomes either procedural or declarative knowledge that can be called on by the learner to inform the decisions they make about their work or their life. The participants felt that currently, online delivery and support for VET can do this in a number of ways:

- Transmission of information *en masse* suits some learners who prefer to read, interpret and work at their own pace.

- Online learning provides multiple opportunities for communication and interaction.
- Constructivist approaches are well suited to the medium.
- Questioning encourages reflection.
- There are opportunities for group work and online collaboration that can be fostered.
- Logs and journals online can monitor and support students' learning and encourage reflective learning.
- Having activities linked to outcomes encourages online learning.
- Having courseware which engages the students in the learning process is desirable.

However, they placed a number of restrictions on the effectiveness of current practice. Firstly reflection needs to be guided and supported.

> I have seen resources online which in the hands of a good teacher would be immensely useful in encouraging students to become reflective. The role of the teacher or trainer is still crucial in providing the feedback or illuminating the issues. People don't map their own learning on their own unless they are very sophisticated. I haven't actually seen anything in online delivery that could achieve this outcome.

All of the approaches which participants suggested as encouraging reflective learning are contingent on teacher commitment and knowledge of the capacities of the medium. The issue of the time-hungry tendencies of the medium was mentioned frequently.

Ultimately, the test of the effectiveness of the medium in delivering reflective learning can only be measured through assessment and evaluation strategies. These are as yet poorly developed.

> This could only be evidenced by the development of appropriate response mechanisms between the student and the educator. We need to look very closely at the assessment tasks and to try and capture indicators that those objectives and outcomes had been achieved or worked towards. This requires prolonged dialogue and communication which are not always part of the assessment process. We need to stimulate responses from students that indicate that such reflective learning has taken place. And that new viewpoints have been reached.

Respondents discussed the teaching and learning styles that are likely to lead to reflective learning in the online environment. These are summarised by the points below.

- groupwork and collaborative exercises
- assessment tasks that map learning beyond factual regurgitation
- online activities linked to outcomes
- student awareness of their own learning styles and preferences
- transmission for learners who prefer reading
- online journals encouraging reflection
- teacher as a guide and scaffolder of student learning
- commitment to communication and interaction
- constructivist approaches.

What interactions (at the individual learner level) are most effective in contributing to online learning?

All participants thought that one-to-one teacher–student interactions are critical to individual student achievement. Regular contact is important, as well as timely feedback and consistent interaction. The facilitator needs to have a positive attitude and be a good online communicator.

Student-to-student interaction is also important in building up the virtual learning community. Humans still learn best when they are in contact with their teachers and their peers.

The formation of online communities is an essential precondition for effective online learning. Participants maintained that a sense of community reduces learner isolation and reintroduces the vital social and affective dimensions of any learning.

> In terms of the online community, it is about building confidence and a comfort zone so that people feel that they are and can be a contributor to the conversations that are taking place. People need to feel confident about being part of the online community. You need people who are very good at facilitating discussions and structuring them in such a way that learners feel comfortable about being contributors.

The consistent theme in the responses to this question is the need for regular and developmental communication between all of the online participants. This involves new roles for both students and teachers and training in the area of online facilitation.

> We simply cannot assume that people have either the skills or the confidence to take on these new roles. This applies equally to teachers and students.

The following are individual learner interactions that are most effective in contributing to online learning:

- ✧ online community of learners
- ✧ one-to-one teacher to student contact
- ✧ regular and developmental contact between all group members
- ✧ student-to-student interaction.

How does online affect the role and the skills required of those involved in the learning process?

A large number of people are ill-prepared for their new roles and many teachers speak of their increasing sense of deprofessionalisation. On the other hand, participants felt that learners need to develop more independent learning skills. Both these perspectives imply new roles and skills for teachers and learners online that were reiterated by participants.

> Teachers need to be able to step back from the traditional view of learning and teaching and be prepared to take on a more facilitative and communicative role. They need to be practitioners in the use of the technology. They do need to have a level of skill and a level of understanding of the potential of that technology and how it can lead to outcomes. Students may already have the skills. There are a lot of management skills that are important as well. When you introduce technology into your pedagogy there is a fair bit of management that has to be done. The management structure changes under the influence of technology and you have to develop new strategies for managing the classroom other than the ones that you have used well up until now.

One participant felt that the age of the teachers using the technology was a critical factor in discussing their roles and skills.

> Younger teachers are going to expect to use technology as part of their teaching and training. If we structure the tools right there will be a quite rapid transformation in the way in which teachers feel about technology and use technology.

A second question was posed to the participants to uncover some of the new expectations of teacher and student skills and the consequent changes in their respective roles. Participants were asked how the skills and roles are different from those required in more conventional educational settings.

The responses fall into the following categories:

Technical skills: the ability to know how to use any of the technology that might be useful in an online arena

> It goes beyond computers to telephony, messaging systems and other forms of converging technology. These are all relevant to the ways we might communicate with one another in new teaching and learning situations. The technologies at the moment require levels of expertise that it is unreasonable to expect every teacher to have. The type of network connection skills, the maintenance of networks, rebooting systems have got to be present somewhere. It is probably unreasonable to expect teachers to have those.

Communication skills: the ability to facilitate and respond to students needs

> The areas where teachers will definitely have to develop new types of expertise are in the communication areas where the technologies are allowing teachers to use audio with graphics, synchronous and asynchronous video streaming. There are learning objects embedded in the kinds of learning resources that are being produced these days which might be manipulated by teachers to effectively communicate with their students. So the ability to use flexibly all the resources that are embedded in learning materials is an important skill that people have not really yet come to grips with.

Management skills: managing time, resources and new interactions

The kinds of tensions emerging in the teaching and learning areas relate to balancing individualised communication and teaching as opposed to the kind of aggregated approach that we see in most classrooms where the teacher is often transmissional in the way they present.

Reconceptualisation skills: the ability to adapt to new curriculum and pedagogies and rethink relationships between teachers and students and respond accordingly.

Participants felt that it is inevitable that curriculum content will change more rapidly than in the past.

> There is a need to promote collegial relationships between teachers and the allocation of responsibility. Mentoring and collaborative activity is an absolute necessity. The bunkering down between teachers will need to change.

There is a need to reconceptualise how learning occurs and how we deliver to match these needs. There is an accompanying need to move away from the linear approach to teaching and learning.

> There are some students who are able to move into an area of learning and learning very quickly while others have a preference for moving methodically through materials and we haven't come to grips at all with what kinds of design rules we need to use to achieve this. Pathways through learning courses are needed and we haven't come to grips with this yet.

Interviewees listed the following factors as influencing the roles and skills of participants in the online process:

- level of organisational and managerial support
- level of independent learning skill
- level of personal management skills
- ability to reconceptualise roles
- level of comfort with a facilitative style of teaching
- level of familiarity with the technology.

What relationships exist between the pedagogical features and world's best practice in online delivery and how does it incorporate these understandings?

All those interviewed struggled with this question and commented on its difficulty. As one participant commented:

> If I knew that I would be wealthy!

Some maintained that world's best practice was concerned with progressively improving practice. They admitted that:

> ... there is still a lot of ground to be broken in this area and that world's best practice is difficult to identify.

The issue is further complicated by the fact that some courses and resources have the best and the worst embedded characteristics in them.

> Some aspects are excellent and others are poor and these maybe contained within the same learning package.

The respondents agreed that there is still a strong focus on delivery 'getting the message out and about', and as a community we have not decided clearly on the criteria for judging pedagogical effectiveness. The reason for this lies predominantly in the fact that content still drives the process and procedural knowledge remains a poor second to content.

> Some of the best practice that I have seen in relation to online learning has actually started with pedagogy, has actually asked people to go back and rethink teaching and learning and questioning the philosophy which they may be using. Best practice or preferably good practice has a lot to do with people reflecting on their current pedagogy and being open about some of the pedagogies which they may not be engaging in at the moment. Best practice has a lot to do with being clear about the outcomes.

One participant maintained that it is world's best practice online if people are:

- ✧ still learning
- ✧ recognising how little they know
- ✧ searching for information
- ✧ reflecting and getting feedback at every opportunity
- ✧ talking to students
- ✧ trying new things
- ✧ reflecting
- ✧ open to new ideas
- ✧ engaging in a process of continuous improvement.

Another respondent commented that world's best practice online is:

> Based on understanding their learners and providing their learners with what they need and using technology in innovative ways, then that is what we should be looking for.
>
> We have done quite a lot of work in this area both in terms of delivery and resources. I am optimistic about the potential for high-quality resources to be available online that could be quite transformative for teachers.

Understanding the potential of the technology and allowing students to have multiple pathways by which they might achieve the competencies or outcomes was thought to be another feature of

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world's best practice. The opportunities for students to explore, experiment, discover, amplify and extend characterised the best pedagogical online practices.

Another participant articulated the criteria against which the technology should be judged. In this way, world's best practice would include the following benchmarks:

- ✧ an understanding of the characteristics of the students that the educator is trying to reach
- ✧ the variety of learning opportunities and situations and pathways that are appropriate to the different characteristics that might exist
- ✧ management approaches with those students that permit communication to occur in a manner that again is appropriate to the needs of the student and that can occur synchronously or asynchronously
- ✧ pedagogies that direct the student towards real as opposed to virtual or telecommunications-based experience.

Respondents felt that world's best practice in online delivery was characterised by the features listed below:

- ✧ understanding and using the potential of online delivery
- ✧ learners reflecting and getting feedback
- ✧ understanding the student cohort
- ✧ engagement in continuous improvement
- ✧ learners learning
- ✧ beginning with pedagogical considerations
- ✧ focus on communication and interaction
- ✧ provision of multiple pathways to learning
- ✧ innovation and evaluation.

Discussion

The people interviewed displayed expertise in a range of online areas. They agreed on the importance of pedagogical issues but disputed that this area had coherence or clarity in the current environment. The interviewees agreed that current practice is underpinned by a range of implicit pedagogical assumptions that may not match with teacher capacity, student ability or course design and content. These assumptions include the need for student confidence and independence; high levels of literacy and numeracy skills; strong levels of persistence, and the ability to cater for learner styles and preferences.

From the perspective of the teacher, those interviewed identified that the technology assumes new skills and an ability to accommodate rapid change within a competency-based training framework.

The participants discussed the potential access created by online delivery and commented that the assumptions made did not always reflect effective pedagogy.

The importance of both formal and informal learning, as active components in an effective pedagogy, were discussed and this is an area needing far more design and curriculum attention. The participants also commented that current online pedagogy limits learner control. The teacher is often assumed to be absent in online delivery and the increasing 'gap' between teacher and student needs to be reconceptualised.

The people interviewed in this section confirmed the significance of the pedagogical indicators retrieved from the literature review. Apart from reiterating the importance of the pedagogical effectiveness indicators, participants also raised issues relating to the:

- predominance of a transmission/broadcasting pedagogy in online delivery of VET
- assumptions about learner characteristics that are not always supported by the realities of teaching and learning
- challenges of working in a competency-based training online context
- unrealised pedagogical potentialities of online delivery
- need to recognise and reiterate the social dimensions of learning
- need to support students through an analysis and appreciation of their own learning styles
- suitability of 'blended' learning opportunities for most students
- complexity of determining VET content suitable for online delivery
- impact of age profiles on online teaching and learning.

Participants also talked about the issue of 'transferable skills'. This was a relevant discussion given the focus in this project on applying the productive pedagogies framework to the data collected.

Participants reinforced the importance of skills reported on in the literature; that is, technical skills, communication skills and management skills. However, the acquisition or possession of specific new skills was recognised as only the first stage in a discussion of online pedagogy. Participants also described the need to go beyond these skill descriptors and critically analyse the totality of the learning experience. The framework of the 'productive pedagogies' described in the chapter entitled 'A framework for online pedagogy' (in volume 1 of this report), offers a way of moving beyond 'those things that don't constitute pedagogy' to a holistic appreciation of online pedagogy.

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Appendix 2: Workshops

The workshop participants focussed on the six research questions in order to test the pedagogical effectiveness indicators derived from the literature review and stakeholder interviews. The draft questionnaires were also developed and then examined in terms of their ability to make explicit the pedagogy of online delivery. The discussions raised sets of interrelated issues that have been organised around the research questions and participant voices are recorded in italics throughout this chapter.

The workshops were held at the Western Institute of TAFE, Orange, New South Wales, Canberra Institute of Technology and Holmesglen Institute of TAFE, Holmesglen, Victoria. The workshop participants included teachers of online courses and subjects, educational designers, web managers and staff trainers responsible for teaching online teachers about the online environment.

These individuals were 'experts' in their fields and can be classified as enthusiastic 'early adopters' of online teaching and learning. It is important to note that their attitudes and knowledge do not necessarily reflect those held by the majority of teachers and trainers. However, as individuals, they have had the experience and capacity to stand back from the rush of technology and comment credibly on their own experiences and the reported experiences of others.

What are the pedagogical assumptions that underlie online delivery of training?

The pedagogical assumptions raised by the participants have been collected under the following headings: speed of change, imposition, 'print to screen', reflection, theories of constructivism, the 'enthusiasm factor', student characteristics and work patterns. These groupings reflect both the environment in which online delivery of VET is situated and a critical evaluation of the resultant pedagogy as it currently exists.

Speed of change

Participants agreed that the idea of a coherent online pedagogy was crucial. They discussed the need to develop principles and practice guidelines that considered not only the materials and the students, but also the practice of the teachers involved. However, they recognised that there were certain obstacles to this process. One of the identified obstacles was considered to be the rapid acceleration of change in the technology itself, and the disparity of skills and exposure to the media affecting both teachers and students.

> People don't have the time to sit and reflect, to absorb new knowledge and reflect on their practice. You have to dive straight into the course and you sometimes learn the best way you can through a seminar here or there.

There is an obvious tension between the need to evaluate effectiveness and the competitive edge created by technology that creates a constant sense of urgency on all involved.

> If we don't get in there and do it we will miss out.

One participant summarised these assumptions as the 'Bill Gates pedagogy' where:

> ... you don't have to be best, just first. Our imperative as teachers is that we want to do the best we can but why take time for quality when speed is the driver?

Imposition

Participants felt that online pedagogy was often framed by the software and then consolidated by the exigencies of time. One explanation of these practices rested with increasing casualisation of staff.

> The trouble with trying to characterise online pedagogy is the assumption that you can characterise it and you can make logical sense of what is happening and then transform it into work design for teachers who can then organise their work around it. Well that's completely contradictory. The residual activity is making your pedagogy fit into a particular framework determined by the software adopted. WebCT which we use here is a classic example because it is a kind of forced pedagogy.

The apparent willingness of teachers to accept the prepackaged materials with minimal pedagogical input on their part is explicable in terms of not only the increasing casualisation of staff, but also in terms of the amount of preparation and lead time that is required if a more social approach to learning is considered.

> The typical TAFE teacher carrying out 20 hours a week face-to-face [teaching] and other factors have impacted on the incidental time that used to be used for class preparation. A lot of it is done on the fly. Beyond minimal preparation a programmed learning approach where every learning experience and learning object is planned represents hundreds and hundreds of hours.

Participants felt that the pedagogical assumptions are difficult to unearth for a number of reasons. The expectations of what the medium can do have been publicised to the extent that teachers now believe that:

> ... it can do everything. As the bar in the resource development is being raised we are beginning to rely on it to provide what we as teachers would have traditionally provided off our own bat.

Some participants felt that they had lost their pedagogical control in the face of a technology that is beyond their competence to create and develop. For those participants involved in the design, development and implementation process, the inordinate amount of time required was a crucial determinant of their level of pedagogical control. They were committed to the pedagogical effectiveness indicators, understood and could articulate the importance of interactivity in particular, but questioned their capacity to deliver the practices that matched their commitment.

'Print to screen'

Another pedagogical assumption appears in the practice of placing print-based materials online.

> To a large extent what we are using our system for is putting all our print-based materials online. There are some fancy things but ... it is really just book-based with some online stuff so you can get into a bulletin board or email a teacher.

The more interactive and constructivist practices require skill, time and predisposition that is the province of enthusiasts. Some participants however, felt that teachers are focussing much more on interaction and communication as essential elements of their practice and moving away from simply transmitting information. This was occurring in those content areas suited to online delivery such as information technology, where the effects of programs such as Learnscope had raised teacher skill and confidence levels.

> We can use the medium much more for communication, for interaction and for constructing knowledge—not just presenting information. The available materials provided via navigation are offering different levels of access to information. Learning is becoming much more flexible rather than linear.

Reflection

The notion that the technology drives the pedagogy is juxtaposed beside the idea that the medium also forces teachers to be explicit about their pedagogy.

> There are a lot of things that you would do subconsciously as a teacher face to face, and you have to be aware of your processes and what you are trying to do in a conscious way.

Certain aspects of the technology encourage reflection.

> The medium of online gives us an opportunity to behave and act in the learner's role in a way that we would not do in a classroom. There is a huge potential there for the meta-cognitive skills to be used to think about how I am behaving as a learner.
>
> Face to face we make some very large pedagogical assumptions. Online you cannot assume that anything will happen unless you make it happen.
>
> How am I going to get across the unwritten messages? How do we set up experiences for students so that they can hear the messages that we want them to hear?

Theories of constructivism

Constructivism has been suggested as a suitable teaching practice online and as an assumption that informs design and delivery. However, the relative effectiveness of this pedagogical assumption was questioned by a number of participants.

> There is a huge jumping onto the constructivist bandwagon. Simply putting a simulated workplace online in front of some content does not equal a constructivist form of learning. It's difficult in content areas to construct new knowledge because constructivism has as its base assumption that the students have something to construct from. Some content areas are just not suited to this assumption.

There are pedagogical assumptions made that, by creating a constructivist environment for learning, the activity is made more effective. This was disputed by some participants, who felt that open information often gets in the way of students recognising their problem-solving activities. The interest in constructivist pedagogy also raises the question of professional responsibility, and while an attractive way to present information it often leaves a '... muddle unless the teacher provides an explicit map for the way in which students can approach the materials'.

Simulations provided no opportunity for teachers to match the environment with their students. They felt that this constrained their practice in ways that were not always positive.

> We simply do not have the luxury of choosing a matching environment for our students.

The 'enthusiasm factor'

Enthusiasm for the medium and an appreciation of its potential for learning were thought to be important pedagogical assumptions underlying online delivery.

> The enthusiasm factor is critical.

If teachers have an appreciation of, and commitment to the potentialities of the medium, their inherent enthusiasm would provide the energy required to create sound pedagogical practices. This enthusiasm could be engendered through professional development. However, teacher resistance was thought to be very strong in some areas.

Student characteristics

One of the pedagogical assumptions created by some online delivery is that the students are a homogenous group of learners. Participants felt that this was a flawed assumption.

> A common base of knowledge cannot be assumed.

The medium makes some assumptions about the nature of the learners which entail particular pieces of teacher practice.

> A lot of the learning is predicated on the idea that you are a reasonably independent learner. Our younger TAFE learners are pedagogically dependent and this causes controversy and tension.

Work patterns

Another piece of implicit pedagogy is disguised beneath layers of teacher work practice. The effective use of the medium entails a set of practices outside the workplace and the work hours. Interaction of the kind demanded by effective teacher practice comes with the price tag of extended work hours and the often associated burn-out feature.

Managerially and organisationally some participants felt that their online work '... was not even regarded as teaching'.

Summary

The pedagogical assumptions that underpin the online delivery of VET are determined by pressures often outside the control of the teacher or curriculum planner. The lack of time and competitive pressures, militate against teacher reflection and the resultant practice or pedagogy is often personally unsatisfactory. The imposition of the prepackaged online materials and the lack of teacher competence to design and develop online materials leave practitioners with little pedagogical control. Constructivist assumptions about online pedagogy are not always supported in practice, and in some cases remove important and needed support from students. Teachers needed enthusiasm to sustain online teaching and the medium assumes a level of student independence that is not always present. These assumptions are summarised in the following list:

- 'Print to screen' dominates practice.
- Knowledge of good practice does not match reality of practice.
- Enthusiasm for the medium is a prerequisite.
- Constructivist practice is encouraged but sometimes does not match the reality of practice.
- Medium is driving the usage.
- There is potential for metacognitive development.
- New workplace practices have been created.
- Teacher reflection is limited amongst new users.
- Learners determined by rapid pace of change.
- Students are independent.

What teaching and learning areas are best suited pedagogically to online delivery?

The participants in the workshops discussed both the processes and the products of learning. The level of student experience with the technology was a critical determinant of suitability. On

occasions, student expectations about the nature of their learning and teacher modelling of expected behaviours were not satisfied by online delivery. The more complex the content and the assessment, the less suitable online technologies became. Change, and resistance to change sometimes overrode questions of suitability. The relative level of experience of the learner in the process of managing their own learning was seen to be as important as the content being delivered.

Student experience

The area of study and the level and experience of the learners was considered to be critical.

> In our fully online IT courses we have 20 remote and 20 close-by students. The students found the course advertised on the TAFE VC and enrolled online, so they have the skills that they need and they are motivated. We are validating things they already know and credentialling these. We are not actually teaching them anything new.

The issue of replacing existing teaching and training with online delivery was discussed extensively. The participants felt that a hybrid approach rather than replacement was a more helpful pedagogical construct to work from. This acknowledged that certain aspects of content were best suited to face-to-face teaching and that: '... there are aspects of online that may actually assist and complement and act as a kind of vitamin supplement of delivery'.

Student expectations

Beyond teaching and learning areas, participants felt that student expectations were dominant in their thinking about the particular pedagogical practices in online delivery. In the welfare area for example '... students come because they know us and the personal elements and the communication are very important. To remove this would destroy the nature of our work'.

This commitment to student expectations was often in conflict with policy imperatives which were seen as taking delivery towards fully online. Participants resisted this blanket imposition for clear reasons.

> Some content lends itself to online delivery and other parts do not.

In content areas where teachers model the behaviours they wish students to adopt (particularly in the human services areas, such as welfare, child studies, hospitality and tourism), behaviour and communication underpin the effective delivery by the practitioner. Participants questioned the ability of the online medium to teach these behaviours effectively.

> These issues are much more crucial in content areas that are human services-based. In the traditional trade areas there are predetermined steps in the acquisition of skills and relationships that are not central to the delivery of content. But in human services this is quite different.

A continuum of content complexity

The level of complexity of the material and the assumptions made about prior knowledge and experience which the students brought to the learning situation were thought to have a strong effect on the 'suitability' of online as a teaching and learning resource and strategy.

> The further up the qualifications framework you go, the more you assume about your learners and their literacy abilities.

The assumption that teachers can deliver to increased numbers of students using online technology is predicated on a discussion of only certain types of content.

> Maths equations or electrical circuitry is fine or if you wish to simply demonstrate a procedure in plumbing. Teaching and assessment is fine.

The participants felt that the more complex content and assessment needs pose problems online. Content that requires analysis, synthesis and problem-solving at a sophisticated level cannot always be accommodated. Similarly, the restrictions on assessment strategies imposed by the current use of the medium demand that teachers rethink the reasons for assessment and redesign assessment tasks for online delivery. The professional implications of this challenge have not yet been accepted in a wholehearted way.

The quality of the resources in certain content areas militates against good teaching practice in some instances. The current trend to create micro worlds where students are expected to act and behave and make decisions:

> ... works better in some contexts than others. In the VET sector we usually have a vocational outcome and there is a level of noise created through the artificial environment that is very off-putting to some students.

Open-entry courses were regarded as problematic online. Students could not be assumed to have the technological skills or the underpinning knowledge that would allow them to be effective learners. The activity of returning to learning left these students unsure about their status as learners and they did not need to have this attitude either reinforced or aggravated by online difficulties.

> Because they can play computer games doesn't mean they can use online for more formalised learning—the demands of the course may be completely different.

The issue of effectiveness of online simulated work placements and experiences was discussed. While the creativity of the designers was acknowledged, it was also felt that the VET content generally demanded engagement with the reality of the workplace rather than its simulation.

Change and development

The inherent resistance to change was thought to be a factor which prevented the adaptation of online materials to certain content areas irrespective of issues of suitability.

> People do not like change. A lot of people in our department say that it is just not relevant.

The model for the development of online teaching sites and resources is important. Two teachers involved in the design and delivery of an online course began the process with a focus on the learner and wove the content around these considerations. They had experience with the learners face to face and were confident about their content. Their enthusiasm for both the process and the product translated to their students.

Summary

The teaching and learning areas that are best suited pedagogically to online delivery are circumscribed by student experience and student expectations. Participants commented on the fact that the complexity of the content had a strong effect on suitability: the more complex the content, the more difficult it is to teach effectively online. Those services where modelling and communication are crucial components of the process of teaching and learning were not considered suitable for total online delivery. Suitability of content was also influenced by the process of materials design and the role that teachers played in this process and their attitudes. The greater the distance between materials creation and teacher delivery, the greater the likelihood of pedagogical disjunction.

The teaching and learning areas that are best suited pedagogically to online delivery, are defined by the features described below:

- Open-entry courses pose problems of technological skill and underpinning knowledge.
- Complex teaching and assessment is less suitable than simpler lock-step material content and procedures.

- ✧ Student experience with technology is a critical determinant.
- ✧ Information technology courses are more suitable than courses dealing with human resources.
- ✧ Student expectations influence suitability.
- ✧ Teacher attitude sometimes overrides suitability issues.

What teaching and learning styles facilitate effective online learning?

Participants recognised that teaching and learning styles facilitate effective online learning to different extents. The level of effectiveness was determined by teacher and student experience, the availability of time, the online teaching practices adopted and literacy skills.

Variety of teachers and learners

> Policy is saying let them all learn online. But students have different skills and learn in different ways. Some need a teacher right beside them and some are independent learners, some are self-directed and some need lots of visuals.

Teachers reiterated the need to encourage independent learning, yet recognised that a considerable amount of work is required to create this status.

> You may want to encourage independent learning but my goodness there is a process to get there!

The teaching styles which have been reinforced by years of comfortable experience do not necessarily translate into effective online practice. Professional development and support are needed to explain the teaching styles based on interaction that can lead to improved outcomes online. The principles of adult learning, with a focus on the experience and skills which the learners bring to the situation, was seen as being overlooked by the medium and its accompanying pedagogical practices. The collaborative approach to teaching and learning was regarded as fundamental to effective learning online and '… a lot of work needs to be done on making this work online'.

In terms of prerequisites for successful online teaching, participants echoed the maxim that '… teachers want a sense of ownership'. This was not always the case and the process of materials design worked against the involvement of teachers and an explicit acknowledgment of their teaching styles.

Beyond the documented styles and preferences of the learners, participants felt that the age group had a lot to do '… with the acumen with which they handle the materials'.

Motivation was also seen as a crucial determinant in the level of effective learning that resulted online.

> Those who succeed are very focussed and very determined to achieve their goals. This is the confounding factor in all of this discussion.

Students who have a degree of intellectual flexibility and who are persistent learners were well suited to delivery in this mode. The participants felt that mixed modes catered for the broad range of students in their classes.

The 'goodwill' factor

A number of participants identified the notion of 'goodwill' as underpinning effective online teaching. There was no dispute about the principle that student and teacher interaction was regarded as central to effective online learning.

However:

> … the effectiveness of the pedagogy is influenced by how much goodwill each individual teacher is willing to expend. The more proficient you become as a teacher offering online provisions, the more the activity is not factored into your workload. You have to think of yourself as working over a 24-hour period rather than an eight-hour one. People are enthusiastic and they love it, but they can't sustain the good practice that they know will work.
>
> IT students have the initial skills and the underpinning knowledge and the preference for working in the medium.
>
> Active learners find the medium attractive.
>
> Majority of students love it.
>
> Participation in online discussions and forum can offer something to the more kinesthetic learners; those who like to teach others.

Problem-based learning as a teaching style was seen to be well suited to the internet.

> … what is crucial is the way the teacher accommodates the different learning styles.
>
> The medium can cope with different learning styles but the critical issues is the amount of time the teacher has available to construct particular kinds of learning experiences.
>
> … learning styles are important but before this people need to be able to read and write and have some basic computing skills.

Summary

Participants felt that effective online learning was facilitated by a complex set of teacher–learner interactions. They saw the independent self-motivated, focussed and persistent learner as the ideal candidate for online delivery. The teacher at the other end of equation needed all of these traits as well as being flexible and having a teaching style characterised by a sense of goodwill and a commitment to the principles of adult learning.

Participants recognised that constructivist practices and problem-based learning approaches were the most pedagogically sensible ways to approach online delivery.

The features of teaching and learning that need to be present if online learning is to be effective are summarised by the following points:

- technological acumen
- active learners
- flexibility
- high levels of intrinsic motivation
- high levels of teacher 'goodwill'
- problem-based learning
- independent learning
- adult learning and teaching styles
- literacy skills beyond a functional level
- persistence.

What interactions at the individual learner level are most effective in contributing to effective online learning?

Working together in a flexible delivery mode was seen to be a positive interaction which both students and teachers could recognise and articulate. The level of interactivity provided by the medium was seen as particularly effective for students from non-English-speaking backgrounds, particularly those of Asia.

> The use of email is becoming very popular and it fulfils a function where neither writing nor speaking would be satisfactory. The medium tolerates mistakes in the conventions of speaking and writing and in this way allows students to venture a little further with their interactions and their learning.

The conventions of email create a sense of informality which lubricates more collegial relationships and interactions between teachers and students. For students from an Indigenous background the non-confrontational nature of online learning, and particularly email, and the non-competitive way of relating outside a traditional classroom environment addresses a number of issues. The medium provides cultural safety and protected communication where mistakes are less publicly displayed and more tolerated than in a face-to-face situation. The medium encourages a degree of intellectual risk-taking that can be built on to encourage learning. Furthermore, electronic access over a sustained period of time allows for the building of a productive learning relationship.

The relational dimensions of learning were therefore felt to be crucial in contributing to effective online learning. Fostering these characteristics online required a large investment of time and emotional energy.

The possibilities for interaction between students and teachers working online exists and is productive when used capably. However, some participants felt that this level of interaction was not being used as effectively as possible. The flexible enrolment and delivery systems often worked against the creation of a truly interactive learning community.

> We have a philosophy of start anytime, finish anytime which often means that your student numbers are highly variable and you might only have one student or two students who are at the same stage and this makes interaction difficult.

Constructivist pedagogy

Constructivist pedagogy encourages particular kinds of interactions at the individual student level. These interactions entail skills that have to be taught and learnt. Participants commented that these interactions are not always positive for students.

> Constructivist experiences can be incredibly powerful but they can be extremely confusing as well—and demotivating.

Some made the point that students need to have a map of where and why they are going, and how they will know when they have arrived.

> People need a sense of where things fit together. They lose their way because things do not necessarily fit together.

Summary

Participants felt that the interactions at the individual learner level that are most effective in contributing to successful online learning revolve around the communicative and relational capacities of the technology. The questionable ability of teachers to sustain these dimensions of teaching and learning was an issue, particularly in an environment of increasing policy emphasis on 'flexibility'. Creating online learning communities implies a stable enrolment pattern that is not

supported by current procedures. Constructivist approaches also encourage effective interactions online. However, participants felt that the pedagogy of online constructivism was poorly understood and poorly practised, leading to student confusion and frustration.

The individual learner in an online environment needs to be engaged in the interactions listed below in order for their learning to be effective:

- developing online relationships
- student–student collaboration
- email conversations
- teacher–student contact and collaboration
- electronic contact over a sustained period of time
- provision of 'organisers' for content and assessment.

What effect does online learning have on the roles and skills of those involved in the learning process?

This question was discussed by participants in detail and approached from a variety of perspectives. The lack of clarity about the respective roles for teachers, students and the technology experts was discussed. The following questions were put to the participants: What is the expected set of roles, where is the support for teachers and students and what is the difference between technical support and teaching support? The lack of explicit information on these roles causes confusion and ambivalence which, when mixed with a lack of confidence or expertise, confounds the online teaching and learning situation. Participants felt that they needed to be more deliberate and explicit about how and what they were delivering.

Efficacy

A majority of the people involved in online learning both as teachers and learners regard themselves as novices. The technology removes a belief in the efficacy of their traditional roles. Teachers bring with them a remarkable amount of experience and expertise which is often denied or unrecognised. 'Online is something that people are very insecure about', and teachers and students 'seem to underrate their technological skills'. The sets of expectations that online delivery imposes on teachers leads to a confrontation between these and 'their own technological abilities'.

This has led to a sense of deprofessionalisation and a recognition that teaching and training online is very different. There is a tendency to 'discount all the skills that you have built up through your career'. The new role for the teacher in this context is to 'apply what you already know in a new environment'. The rapid pace of technological change and its take-up rates often prevents this process of reflection and development.

> Given the rapidity of change in programs, techniques and equipment, it is not surprising that we find it hard to deal with. We simply don't have the skills to deal with such big changes so quickly.

Day-to-day roles

The impact of online delivery and support on the day-to-day activities of teachers and the consequent skills which they needed to develop, was reiterated by all participants. The exigencies of day-to-day delivery, including the technical inconsistencies and the levels of technological unreliability, imposed some organisational demands on teachers and students which are new and as

yet managerially unacknowledged. For instance, teachers in the welfare area commented that their students become very tired working online.

New roles in communication

Certain functions of the technology redefined the teachers' roles and skills dramatically. 'Email sets the teacher quite outside what happens in the classroom. The role of the teacher is advisory and informal.' This informality has its consequences and the participants felt that the egalitarianism entailed higher levels of teacher accountability which required new skills and new roles for both teachers and students. Establishing the rules for interaction, security and privacy were important at the outset. For some teachers the new levels of informality have posed problems.

> Some teachers are very precious and they are used to chalk and talk and they are not going to find the medium comfortable. There is a lot more criticism of teachers in the medium of email and chat. The voice and role are different.

Assessment

One of the roles of teachers articulated by the participants was that of diagnosing and fixing errors.

> A good teacher looks at not just the right and wrong answers but extends their gaze to where they went wrong.

This role is not easily transferable to an online medium.

Management roles

The organisational context in which the online teaching is located influenced the new roles and skills for teachers. How it is organised, how it is managed, how it is slotted into the day, how it is staffed and how it is funded, all influenced teacher attitudes. The level of institutional support for online learning determined the extent to which new skills and roles could be explored, evaluated and reflected on.

> Implementation issues are often under-estimated.

The extent to which planners considered the changing roles of the teacher and the student, and the facilitation that was necessary to promote smooth changes was thought to be disregarded in a lot of instances. Some participants commented that this issue 'cut to the chase'.

> There is a technological approach versus a pedagogical approach and often the planners are looking at satisfying the demands for figures and stats and they have a very mechanistic view of the pedagogical implications.

Professional development was thought to address segments of this concern and recent programs have done a great deal to upskill teachers. However, the fundamental question which teachers continue to ask is how to do the things that they have to do well in a new environment. There is a lot more to this than just learning to use the keyboard and the software.

Planning roles

The problems associated with role of the teacher as an organiser of online materials was seen as symptomatic of the teaching profession generally.

> A lot of experienced teachers are not planning enough. You only have to look at the photocopier five minutes before class is due to start. The time and planning involved in putting a semester's work online just writes off the benefits they perceive to be there. All that lead time is what cuts them out.

Participants felt that the roles of the effective online teacher include being:

- a resource
- an onlooker
- a facilitator
- a participant
- a leader.

And that these roles are mixed and matched to suit the student cohort and the materials.

Technological roles

The issue of the technological competence of both students and teachers impacts on pedagogy and effectiveness and determines roles in clear ways. Some participants mentioned students who have returned to learning after a long absence and the levels of intimidation that they feel in an online environment.

> With students such as these we begin with fairly structured strategies and then a couple of months down the track we start moving towards those other roles. The extent of their experience becomes critical.

This same construct can be applied to teachers. Teachers who are new to the technology are focussed quite realistically on making the machines work and managing the teaching and learning online. The next level of engagement comes when a substantial number of the technological processes are automated and the time to reflect on practice is released.

> This is fine for teachers who are passionate about the technology but it's not fine for those teachers who are not interested. They have to get involved because they have to, but they feel that it is not something that students really need or want

Summary

Online delivery of VET demands new roles for teachers and learners, and the participants discussed these and their effects. Participants felt that the roles were unclear, ambivalent and not articulated or understood by management. For teachers, this lack of understanding was clearly reflected in changing and burgeoning workloads, poor staffing arrangements and industrial relations provisions that did not 'factor in' the time and professional development needed to adjust to the new roles.

Participants also commented on the sense of deprofessionalisation that new users of the technology suffered. Beyond these frustrations, participants discussed the new communication, planning and technological roles that teachers and learners had to adopt if they were to be effective online.

Online learning prescribes new roles for teachers and learners, and entails the development of new skills. The effect of online learning on the roles of both teachers and learners are summarised in the following points:

- new definitions of time and work patterns
- new levels of institutional support
- higher levels of teacher accountability
- lack of clarity about teacher roles online
- new rules for interaction, security and privacy
- pace of change contributing to 'deprofessionalisation'
- assessment processes to be reconceptualised

- higher levels of course planning
- new levels of technological skills and experience needed
- varying levels of efficacy influencing self-perception
- application of what is known in a new context.

What are the relationships between pedagogical features and world's best practice?

The participants discussed 'best practice' in terms of a holistic approach to pedagogy. They identified the need to offer a range of activities online to cater for different student requirements. They felt that resources should be constantly updated and that a 'hybrid approach' met most student needs.

> The greatest online providers are now NET G and SMARTFORCE who have got 4000 online courses. You can go to a desktop and transport the course you want. If that's best practice and the model, where [sic] does that reduce everybody else to?
>
> What is working best is the mixture of modalities.
>
> Where we retain face-to-face contact but where we reduce it, for example in our Grad Dip modules, the student outcomes reflect the success of the 'mixture'.

Conclusion

The participants in the workshops were both experienced and highly contributory. The discussions of the research questions typically covered a wide set of topics directly and indirectly related to the online pedagogy of VET delivery.

All the participants recognised the potential for online delivery of VET to make a difference to the flexibility and effectiveness of student learning. They considered that the pedagogical assumptions which underpin effective online delivery included factors relating to levels of teacher and student independence, enthusiasm and a commitment to inclusivity. However, they identified that current pedagogy is constrained by pressures from 'outside', such as the rapid pace of change, external design of materials and limited opportunities for teacher reflection. The participants agreed that some content areas are more suited to online delivery than others and that student and teacher familiarity with the technology was a critical determinant of effectiveness.

The teaching and learning areas that are most suited to online learning in VET were influenced by factors such as student and teacher expectations, levels of content complexity and the flexibility of entry arrangements into courses.

Participants agreed that the teaching and learning styles that facilitate online learning focus on independent learning, problem-based learning, and constructivist learning. The characteristics of effective online teachers and learners include flexibility, high levels of intrinsic motivation, persistence and technological and literacy skills.

The interactions at the individual learner level which promote effective learning in online VET include collaborative activities, sustained contact, the development of relationships and high levels of course content organisation.

Participants agreed that online pedagogy has entailed new skills and roles for teachers and learners. It is not simply a matter of transferring face-to-face practice into a new environment. In particular,

the issues of teacher accountability, the reconceptualisation of assessment and new levels of technological and communicative skills were considered critical.

Participants were less sure about what constituted world's best practice online, and commented on the need to adopt a hybrid approach to delivery which is holistic and supported by constantly updated resources.

The workshops confirmed that online pedagogy is a difficult topic to address and that the day-to-day practices of teachers are disparate and not altogether satisfying. Participants identified the pedagogical potential of online delivery, supported its development and clearly recognised areas for change and improvement.

The workshops confirmed the validity of the pedagogical effectiveness indicators. Participants modified the language and emphasis, leaving the intent unchanged. They also reinforced the usefulness of applying a research-based theoretical framework to the complexities on online pedagogy. The range and depth of discussion about the factors influencing online delivery, the effects on teachers and learners, and the multiple perspectives on the different dimensions of online pedagogy underpin the application of the productive pedagogies framework to the project data.

Appendix 3: Survey results – teachers

Teacher profile

In all 88 teachers completed the survey. The survey found that around 65% of teachers are in the 31–50-year-old age bracket, while 78.4% of the teachers involved are 31 years of age or above. Of the teachers involved, 32.5% were male and 67.5% were female; 6% of the teachers came from a non-English-speaking background.

Figure 3.1 shows the number of years since the teachers involved had trained as teachers. It is significant that 80% of teachers trained more than six years ago, indicating that online delivery would probably not have been a component of their initial teacher preparation. This, combined with their relative inexperience with this form of teaching (table 3.1) contextualises other information. In terms of the continuum of experience, they can be regarded as online 'novices'.

Figure 3.1: Years since you trained as a teacher?

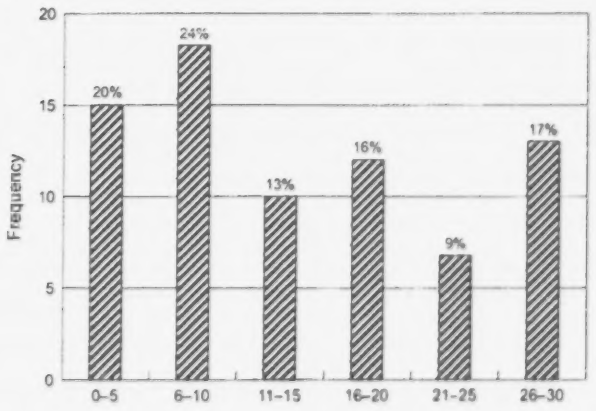

Table 3.1: Years teaching online

	Minimum	Maximum	Mean	Std. deviation
Years spent in teaching online	.00	6.00	1.6893	1.6738

Online courses and modules

Teachers were asked to list fully online courses they were delivering as well as subjects/modules that they were delivering as part of mixed-mode teaching.

The responses and comments indicated that this distribution between course and module was not made clear in the questionnaire. Wherever possible, the teacher comments were used to allocate the

course/module to the correct category of either a fully online *course* or to an online *module* as part of mixed-mode delivery.

Fully online courses

Teachers indicated that they were delivering the following courses fully online:

- Text in technology
- Diploma of Business (e-commerce)
- Online office computing
- Certificate II in Information Technology
- Web production certificate
- CD-ROM—distance education courses
- Certificate II Business—Higher School Certificate (HSC) students remote
- Communications online
- Bachelor of Business (Tourism Management)
- Introduction to Online & WebCT—Certificate III
- Introduction to e-Commerce
- Management of internet marketing
- Institute staff development online
- Certificate III in ESL
- School support officers professional development
- Graduate certificate—introduction to teaching online
- Certificate IV in Assessment and Workplace Training
- Certificate III in Information Technology.

Online as part of mixed-mode delivery

Teachers indicated that they were delivering the following subjects/modules online as part of mixed mode delivery:

- Instructional design
- Writing research reports
- Certificate IV in Web Production
- Special Fares (Tourism and Hospitality)
- Armed Services modules
- Certificate I Building and Construction
- Business correspondence
- Understanding cultural differences
- Essentials of making presentations
- Equal employment opportunity
- Fares and ticketing 1 and 2
- Training skills for effective learning—modules 1 and 2

- Systems analysis and design
- Problem solving
- Dealing with difficult service situations
- Business understanding (Key performance indicators and management solutions)
- Workplace assessor
- Train small groups
- New performance management
- Tour planning and operations
- Diploma in Business
- Certificate IV in Business
- Level III User Documentation
- Diploma in Human Resource Management
- English for the workplace
- Change management
- Commercial negotiation
- Certificate II Library and Information Studies
- Performance management
- Certificate III ESL.

The spread of these courses across the Australian Qualifications Framework (AQF) levels is reflected in the next section.

Table 3.2: Australian Qualifications Framework level

AQF level	Per cent
Certificate 1	7.5
Certificate 2	16.4
Certificate 3	26.9
Certificate 4	23.9
Diploma	16.4
Advanced diploma	9.0

Table 3.2 shows the Australian Qualifications Framework level of the course/modules being delivered. Nearly 75% (74.6%) of the courses are at certificate IV level or below; 50.8% of the courses cluster around the certificate III or certificate IV level and 67.2% of the courses are delivered between Australian Qualifications Framework levels 2 and 4. Of teachers surveyed, 80% worked full time and 20% worked part time.

Course/module information

Table 3.3 shows that email is used most frequently by teachers in course/module delivery (20%). Email and web-based course content made up 38% of the delivery methods used online.

Table 3.3: Features of technology used in delivery of courses/modules

Technology being used in online delivery	Per cent
Email	20
Web-based course content	18
Electronic submission of assessment	15
Assessment completed online	14
Bulletin boards	12
Chat	10
Subject forums	7
Course forums	3

The following is a summary of other features of technology used by teachers:

- use of CD-ROMs
- basic navigation
- discussion areas
- information hubs
- downloading of notes
- online tests, both summative and diagnostic
- phone
- fax
- video-conferencing facilities
- virtual classrooms
- student file-sharing.

Twenty-nine per cent of the available technology features are used for either online assessment or submission of assessment items.

Table 3.4: Time spent online teaching

Per cent of time spent online teaching	Per cent
0–15%	44
16–30%	29
31–50%	17
51–70%	7
71–90%	3

Table 3.4 shows that 44% of teachers spend less than 15% of their time involved in online teaching, while 73% of teachers spend 30% or less of their time on teaching activities online. When this information is placed beside the other data we have a picture of teachers who:

- trained more than six years ago
- are relative newcomers to online delivery
- spend about one-third or less of their teaching time online.

Teacher behaviour

Teachers indicated the extent to which their online teaching behaviour was characterised by the features of pedagogical effectiveness. Table 3.5 sets out these results.

Table 3.5: Teaching behaviours

Indicator	Seldom/never %	Sometimes %	Usually %	Always %
Creating a learner-centred environment	2	25.5	39.2	33.3
Using questioning strategies	4	33	43	20
Attempting to build relationships between students	12	24	39	26
Engaging students actively in their learning	2	22	35	41
Employing motivational strategies		31	41	28
Monitoring student progress on a regular basis	4	16	41	39
Providing timely and constructive feedback	2	6	47	45
Encouraging critical thinking	2	31	35	31
Evaluating my students' learning	6	23	29	42
Reflecting on my own practice as an online teacher/trainer	2	29	31	39
Using constructivist approaches to teaching and learning	6	33	35	25
Facilitating student learning	0	40	40	20
Encouraging student debate and discussion	12	27	39	23
Providing guidelines about assessment and work schedules	4	6	46	44
Transmitting content to the students	45	19	44	33
Developing analytical skills in my students	2	40	37	21
Creating a sense of community amongst my students	15	33	35	17
Identifying student learning styles prior to teaching online and matching materials to the students' needs and learning styles	27	46	17	10

In relation to teacher behaviours online table 3.5 shows that:

- 72.5% of teachers characterise their online teaching as usually or always focussing on creating a learner-centred environment.
- 63% of teachers use questioning strategies usually or always as part of their online teaching.
- 65% of teachers attempt to build relationships between students usually or always.
- 76% of teachers try to engage students actively in their learning.
- 69% of teachers employ motivational strategies usually or always.
- 80% of teachers usually or always monitor student progress on a regular basis.
- 92% of teachers consider they provide timely and constructive feedback usually or always.
- 66% of teachers consider they encourage critical thinking usually or always.
- 71% of teachers consider they evaluate student learning usually or always.
- 70% of teachers believe that they reflect on their own practice as an online teacher/trainer usually or always.
- 60% of teachers consider that they use constructivist approaches to teaching usually or always.

- 60% of teachers consider they facilitate student learning usually or always.
- 62% of teachers believe that they encourage student debate and discussion usually or always.
- 90% of teachers consider that they provide guidelines about assessment and work schedules usually or always.
- Relatively few (27%) identify student learning styles prior to teaching and match materials to student needs.

Learning strategies

Teachers were asked to estimate how often they used a variety of online teaching strategies to create learning experiences for their students. The results are presented below:

Table 3.6: Learning experiences

Indicator	Seldom/never %	Sometimes %	Usually %	Always %
Practice and repetition	16	44	32	8
Analysis and synthesis	15	38	35	12
Problem-solving	12	42	38	9
Deep learning	27	47	16	10
Investigation and research	8	31	39	23
Debate	37	36	23	4
Practical experience	15	36	32	18
Theoretical understanding	4	30	48	18
Presentation of visual material	7	31	34	29
Presentation of multimedia information	25	30	21	24
Student–student and student–teacher interactivity	12	30	30	30

In relation to online teaching strategies table 3.6 showed that:

- 30% of teachers felt that they 'always' focussed on interactivity.
- 29% 'always' used the technologies to present visual material.
- 48% of teachers 'usually' used the online technology to create learning experiences related to the critical understanding of the material.
- 38% 'usually' employed problem-solving strategies, with 42% 'sometimes' using problem-solving strategies.
- 47% of teachers 'sometimes' created online learning experiences which encouraged 'deep learning'.
- 37% of teachers 'seldom' or 'never' used debate to create learning experiences.
- 27% 'seldom' or 'never' used 'deep learning'.

Online learning was often used:

- for theoretical understanding (66%)
- to present visual material (65%)
- for investigation and research (62%)
- for fostering interactivity (60%).

It was used relatively infrequently for deep learning or debate.

Teachers were then asked to rank the types of online learning experiences mentioned above in terms of their contribution to creating effective online learning. The results appear in table 3.7.

Table 3.7: Types of online experiences for effective learning

Type	Frequency	Valid per cent
Practice and repetition	7	9.6
Analysis and synthesis	4	5.5
Problem-solving	6	8.2
Investigation and research	9	12.3
Practical experience	3	4.1
Theoretical understanding	3	4.1
Presentation of visual material	4	5.5
Presentation of multimedia information	1	1.4
Student–student and student–teacher interactivity	34	46.6
Sub-total	71	100.0
Missing	17	
Total	**88**	

The teachers in this survey felt that they were focussing on the features of pedagogical effectiveness in their online teaching practice in the majority of cases. When these aspirations are placed beside the actual teaching strategies used, investigation and research and interactivity dominate the repertoire. Practice and repetition were also regarded as important aspects involved in the creation of effective online learning. While the teachers were committed to effective pedagogical practice, the documented learning experiences that facilitate this were used far less.

Suitability of content to online delivery

The issue of suitability of content for online delivery was canvassed with teachers and the results appear in table 3.8:

Table 3.8: How suitable is online teaching for most content areas?

		Frequency	Per cent	Valid per cent	Cumulative per cent
Valid	Not very suitable	8	9.1	10.4	10.4
	Fairly suitable	38	43.2	49.4	59.7
	Suitable	25	28.4	32.5	92.2
	Very suitable	6	6.8	7.8	100.0
	Sub-total	77	87.5	100.0	
Missing	Missing	11	12.5		
Total		**88**	**100.0**		

Forty-three per cent of teachers felt that most content was 'fairly suitable'; 28% felt it was 'suitable' and 6% felt it was 'very suitable'. Eight per cent regarded most content as 'not very suitable'. The issues that teachers raised to support these rankings were collated. These were then allocated to arguments for and against content suitability and these appear below:

- ✧ Content—suitability issues
  - convenience

- access
- content and delivery method identical; for example, information technology
- theory and assessment delivered effectively online
- planning/reviewing/researching activities ideally suited
- difficult concepts in a variety of formats
- opportunities for synthesis of knowledge and skills
- up-to-date information.

✧ Content—non-suitability
- Students prefer face-to-face teaching.
- Practical tasks are restricted.
- Content is 'too vast' to be covered.
- Discussion-based and values-oriented content requires face-to-face contact.
- Team-based content delivery does not transfer well to online environment.

Qualifiers

A large number of teachers qualified their ranking by explaining some of the factors that influence suitability of content either positively or negatively. These included comments about available time and the past experience of students. The balance in a particular course between theory and practice influenced its suitability for online delivery, as did the complexity level of the materials.

Some felt that certain components of a course were suitable for online delivery, but others required classroom or workshop interaction. Teachers overwhelmingly commented that, given the present state of technology, a blended approach to content delivery suited all participants best. Other teachers felt that the age, self-direction and experience of their learning meant that even though content could be delivered online, it should not be.

Online practice and good teaching

Eighty-one per cent of teachers felt that their online teaching matched good practice 'fairly well' or 'very well'. Teachers were then asked to explain their responses to the question: 'To what degree do you think your online teaching matches what you know about good teaching?'

Teachers commented extensively and the answers they provided sometimes tended to bring up issues not specifically related to these two questions. The responses were categorised in terms of student or teacher perspectives.

Student perspectives

Teachers felt that the online environment meant that students had to take on a lot of personal responsibility, and for this reason student orientation programs where the teachers helped students to set goals, prioritise tasks, time-manage and use the particular technology, were important to ensure a healthy match between online delivery and good practice.

A large number of teachers mentioned that the flexibility implicit in online learning matched their ideals of good practice. However, a number qualified this response by mentioning offsetting factors such as low student performances for face-to-face contact and interaction. These comments intersected with teacher commitment to building a 'student community' as good practice which required consistent communication and large amounts of teacher effort, a situation which was not always sustainable.

A number of teachers commented on the student characteristics which would guarantee a solid match between online delivery and good practice. Factors such as motivation, independence and technological acumen were regarded as prerequisites for success. That 'student learning is diverse

and difficult to do online' is often cited and is an indication of the sense of teacher frustration at the gap between what they know works and the realities of online teaching and learning.

Teacher perspectives

Participants felt that teacher confidence and support are critical features of practice which are equally important online and face to face. Others felt that the isolation of the teacher when students did not use the communication tools created a new environment for teaching practice. Some teachers commented that their ideas of good teaching did not translate easily to an online environment: 'Generally I teach by identifying personal preferences/values and experiences in students and I tailor my delivery appropriately. This is somewhat difficult online'.

A number of teachers discussed the differences between online teaching and their previous experiences of good practice: 'Online delivery implies that the rules of teaching are different'. Other teachers cited isolation and access as ways in which online delivery matched their concepts of good practice. The ability to deliver courses and modules remotely was regarded as a move in the direction of greater equity for all students.

A number of teachers also mentioned that the distance between course/module design and teacher implementation militated against teacher autonomy and the ability to follow their own principles of good practice.

> To effectively match my online practice to what I know about good teaching I would need to have been involved in the construction of the two online modules I teach. In other words, my online practice is restricted by the design of these subjects and the platform.

A large number of teachers recognise what they need to do to carry over good practice to the online environment. Features such as developing online relationships, questioning strategies, providing feedback, developing and creating a learner-centred environment were mentioned as goals that they were working towards. Teacher preference was clearly for a mixed-mode delivery and that this allowed them to take the best of both worlds.

The role of the teacher

Teachers were asked to describe their role as an online teacher. The responses provided were categorised and it was clear that the most common description of individual teaching roles were related to:

- facilitating
- motivating
- mentoring
- guiding students' learning.

This was summarised by one teacher who described the role as a 'sounding board to self-discovery learners'. The role of the teacher was clearly focussed on facilitating for students rather than on furnishing content or initial resources. The materials contained in the online courses/modules removed the pressure to 'deliver' and teachers were concentrating on being available, flexible, communicative, responsive and co-operative.

A number of teachers described their role as 'inexperienced' or 'average'. For some teachers, their role was 'difficult, time-consuming and exhausting'. Some teachers felt that their role had been reduced to that of an 'assessor rather than a teacher' although these responses were relatively few. Others commented that their input into student learning was minimal.

A number of teachers regarded their online teaching role as developmental and could clearly see the potential for their own professional growth in online delivery.

Other teacher skills and understandings

Teachers were asked to list other skills and understandings that they had developed because of their online teaching.

The skills provided by teachers can be clustered in the following way:

- Technical skills
  - understanding and refining site design
  - multi-media resource production
  - using a discussion board
  - authorising skills
  - instructional design skills
  - program development in WebCT
  - advanced email skills
  - distribution lists
  - powerpoint use
  - coping with new programs and packages
  - faster keyboard skills
- Curriculum skills
  - program development
  - development of course materials
- Management skills
  - time management.

Teachers generally believed that assessment needed to be undertaken face to face and that they need to be available to help students at regular intervals.

New skills

Teachers focussed most frequently on the development of their technological skills. For some teachers, this meant that their first encounter with online teaching required them to become familiar with basic computer usage. Other teachers added to their existing skills and became more involved with course/module modification and design.

Relatively few teachers referred to the development of new curriculum and assessment skills. This is largely attributable to the frequently prescriptive nature of the course/module materials provided.

The new management skills teachers developed related to time management and the demand to be available at regular and predictable times for their students. *Teaching skills* included:

- motivating
- listening
- coaching/mentoring skills
- mediating chat
- a more active role for teachers
- strategies to create fun
- need to be more reflective

- ✧ improved communication with students
- ✧ use of precise and unambiguous language.

The new *understandings* cited by teachers that have resulted from their online teaching experiences included:

- ✧ Personal/affective
  - patience
  - persistence
  - coping with frustration
  - more flexibility
  - problem-solving
  - coping with time demands.
- ✧ Understanding students
  - increased student support
  - telephone and counselling skills
  - need for constant feedback
  - understanding the needs of non-English-speaking background students
  - focus on one-to-one communication
  - engaging with students
  - appreciation of different learning modes.

New teacher understandings

The new understandings that teachers described as resulting from their experiences in online teaching were most frequently associated with personality traits such as persistence and coping with frustration.

Teachers also focussed on their new understanding of student needs in an online environment. They felt that engagement, communication, and the need for constant feedback were now perceived differently; they also felt that they further appreciated the needs and learning modes of their students.

Goals for online teaching

Teachers were asked to list their goals for online teaching. They were asked to reflect on what, under the best of all circumstances, they would want to achieve.

- ✧ Personal goals
  Some teachers felt that to 'keep abreast of new developments' was an important personal goal. Some also thought that they needed to 'keep improving' through constant updates to materials and resources. Others had the personal goal of developing 'more creative online concepts' to retain student interest and motivation. Less confident teachers felt that their personal goals were aligned with 'much more technology preparation knowledge and practice'. A number of teachers wanted to learn more about online delivery, both in terms of organisation and the teaching strategies available. Some felt that, in this way, they could achieve the goal of 'creating successful online opportunities for learners whilst nurturing the integrity of content'.
- ✧ Teaching goals
  A number of teachers mentioned that the goals for their online teaching were centred on developing motivational techniques, opening up new channels of communication and encouraging an attitude of lifelong learning in their students. Others commented on the goal of making online learning 'student-focussed not technologically determined'.
- ✧ Relationship goals
  Some teachers cited developing good relationships with their students.

- Communication goals
  Increased and better quality interaction were considered important goals for some teachers. Linked to this goal is the idea of regular feedback and the development of an active approach, rather than a passive one to online learning.

- Technical goals
  Some teachers discussed the availability of the materials and the ability for learners to participate outside face-to-face situations as their goals. For others the provision of online assessment and assignment submission were thought to be important.

- Goals for students
  A number of teachers considered that their goals for their students included 'getting them through' by focussing totally on their learning. Others saw the creation of computer-literate learners as important. A large number of teachers focussed on student needs, achievements and cited increasing retention rates as their benchmark of effectiveness.

- Catering for difference
  A small number of teachers mentioned that their goals included enabling the students who might not otherwise have the chance to participate in learning. This was particularly relevant to distance learners who needed effective and supportive guidance to complete their courses.

Advice to novice online teachers

Teachers were asked to hypothesise about the advice that they would give to novice online teachers. They were asked to list the five most important *principles* they would choose to pass on.

Learn about and use the technology
Teachers mentioned the need to be technologically competent as the first prerequisite to teaching online. They suggested that the ability to use the technological tools and familiarity with both the course content and the modes of delivery were critical. A number of teachers qualified this principle by encouraging new teachers to regard this as a gradual and developmental process.

- Student learning
  Teachers frequently mentioned principles that related to the facilitation of student learning. They felt that it was important to let students know 'what to expect' to engage the students actively in their learning. They commented that this could be achieved through the creation of a learner-centred environment which was interactive. They also mentioned that an important principle is 'meeting of individual learner needs' through motivation and interest in the student. Positive feedback, clear instructions, learner relevance and lots of encouragement were also thought to be important principles.

- Interpersonal skills
  Principles relating to interpersonal skills also appeared frequently in teacher lists. The need to build relationships and to concentrate on effective online communication were thought to be important. Terms such as 'empathy', 'understanding' and 'appreciate where your students are coming from' reflected the principles of teacher responsiveness and flexibility.

- Organisational principles
  Principles related to organisation and management appeared frequently in teacher responses. Good planning, the preparation of back-up material and the need to be well supported were amongst the principles they mentioned. Other teachers suggested that clear guidelines for both assessment and work schedules were principles to be followed and that monitoring student progress was important. Issues relating to time management were also mentioned and the general advice was 'time managed well and don't be too flexible'.

- Practical networking
  Teachers also suggested a range of practical principles that would assist the novice teacher. They suggested that new online teachers should 'view each other's materials', 'find a mentor', and 'do

an online course to know how it feels to be on the other end'. They also advocated collaborative relationships between peers as a means of teacher support in an often frustrating teaching context.

Teacher expertise

The participants surveyed were evenly divided in their attitudes towards their own expertise as online teachers.

Figure 3.2: I consider myself to be an expert online teacher

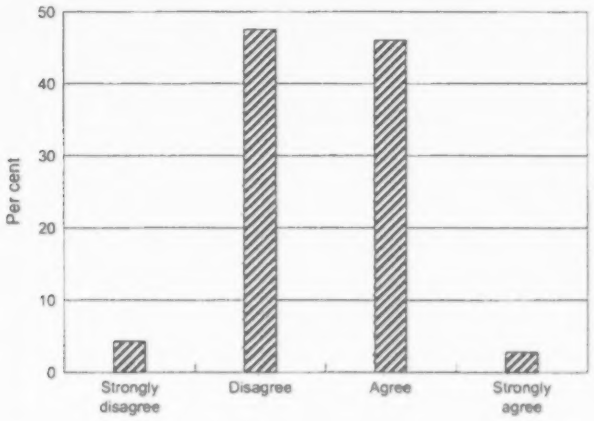

Figure 3.2 shows that around 5% of teachers strongly believed that they were not expert online teachers while around 3% strongly believed that they were.

Figure 3.3: My professional development has equipped me to be a competent online teacher

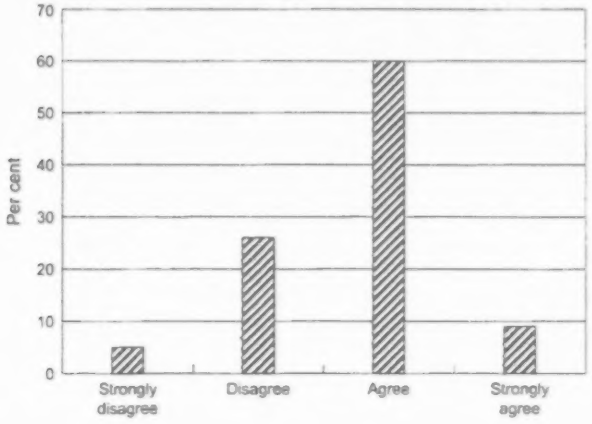

Figure 3.3 shows that 69% of teachers felt that their professional development equipped them to be competent online teachers, while 31% disagreed or strongly disagreed with this proposition.

Figure 3.4 shows that 65% of teachers felt that their face-to-face teaching experiences equipped them to be a competent online teacher, while 35% disagreed or strongly disagreed with this proposition.

Figure 3.4: My experiences as a face to face teacher have equipped me for online teaching

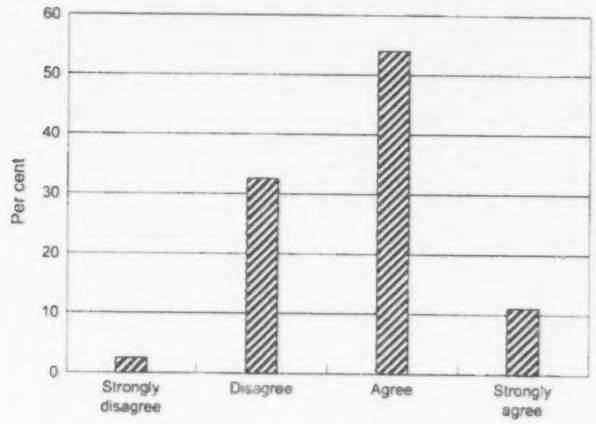

Figure 3.5 shows that 67% of teachers would like more input into the courses they deliver, while 33% disagree or strongly disagree with this assertion.

Figure 3.5: I would like more input into the content online courses that I teach

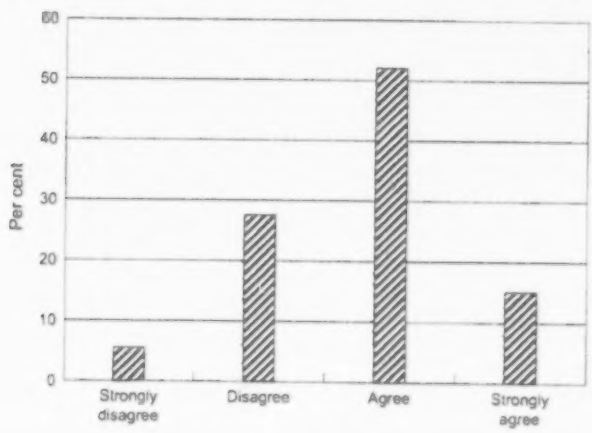

Table 3.8: Teacher skills

	Strongly disagree %	Disagree %	Agree %	Strongly agree %
Methods for facilitating learning	1	3	73	23
Instruction strategies	1	9	67	23
Understandings about my role as a teacher	0	15	64	21
Time management skills	3	14	60	24
Technical skills	1	17	53	29
Relationships with my students	1	22	59	17
Programming and planning skills	0	25	58	17
Written communication skills	8	23	60	9

Table 3.8 indicates that teachers have been required to develop:

- methods of facilitating learning (96%)
- instruction strategies (90%)
- understandings of their roles (85%)
- time-management skills (84%)
- technical skills (82%)
- relationships with students (76%)
- programming and planning skills (75%)
- new written communication skills (69%).

In particular, teachers felt that methods of facilitating learning, instruction strategies understanding their roles as teachers, technical skills and time management skills required particular development for effective teaching in an online environment.

Characteristics of a good online teacher

Participants were asked to describe a good online teacher. The following is the list of attributes they provided. A good online teacher is:

- active
- communicative
- facilitative
- adventurous
- prepared to 'have a go'
- knowledgeable about content and medium
- possesses a vision for the future
- good manager/planner
- organised
- patient
- creative
- motivated
- positive
- emphatic
- supportive
- prompt
- persistent
- technically competent
- someone who monitors student progress
- pedagogically adept
- compassionate
- perceptive
- collaborative

- confident
- committed to learning
- adaptable
- someone who doesn't need sleep and has a good sense of humour!

The list of attributes above clearly focusses on the attitudinal characteristics of those involved in online delivery. Technological skills, while critical to successful teaching, are no guarantee of 'good' teaching.

Teacher attitudes

Forty-nine per cent of teachers felt that they effectively catered for students' learning preferences and styles in an online environment 'sometimes'; 39% felt that they did this 'usually'.

Table 3.9: Teacher style vs. student requirements

	Seldom/never %	Sometimes %	Usually %	Always %
I feel that I can cater effectively for my students' learning preferences and styles in an online environment	6	49	38	6
I feel satisfied that my online teaching matches the cultural diversity of my students	11	39	42	8
A mixture of online and face-to-face teaching suits the needs of my students best	3	14	49	35

Thirty-nine per cent of teachers felt satisfied that their online teaching matched the cultural diversity of their students 'sometimes', while 42% thought that this match occurred 'usually'; 11% felt this match took place 'seldom or never'.

Thirty-five per cent of teachers felt that the needs of their student were addressed 'always' by mixing online and face-to-face delivery; 49% of teachers thought that the mixture 'usually' suited students' needs most closely.

Student needs

Table 3.10 shows teachers' perceptions on the appropriateness of online learning for different types of learners.

Table 3.10: Suitability of online teaching for diverse student requirements

	Seldom/never %	Sometimes %	Usually %	Always %
Visual learners	5	38	39	19
Auditory learners	33	47	19	1
Independent learners	3	20	48	27
Experienced and confident learners	4	15	48	34
Learners who require constant supervision	36	40	21	3
Highly motivated	1	20	35	44
Literate and numerate	0	22	48	30
Technologically confident and competent		17	49	33
Kinesthetic learners	18	36	42	4
Team players	16	55	21	8
From non-English-speaking backgrounds	26	44	28	3
Aboriginal or Torres Strait Islanders	22	52	26	0

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Teachers believed that the students with the following characteristics are suited usually or always to online teaching:

- independent
- experienced and confident
- highly motivated
- literate and numerate
- technologically confident and competent.

The least well-catered-for students are those who require constant supervision, who are auditory learners, or who come from non-English-speaking or Aboriginal or Torres Strait Islander backgrounds.

Online interactions that contribute to student learning

The following graphs set out the ranking made by teachers on the effectiveness of various online interactions in contributing to individual student online learning.

Figure: 3.6: Individual interactions with students via email

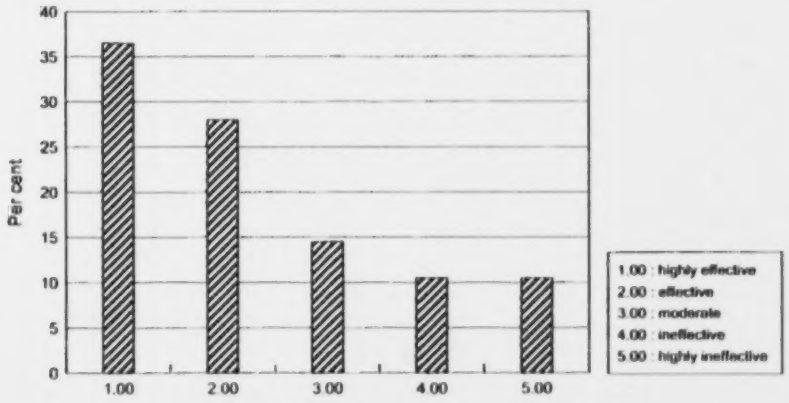


Figure 3.7: Questioning via bulletin boards or forums

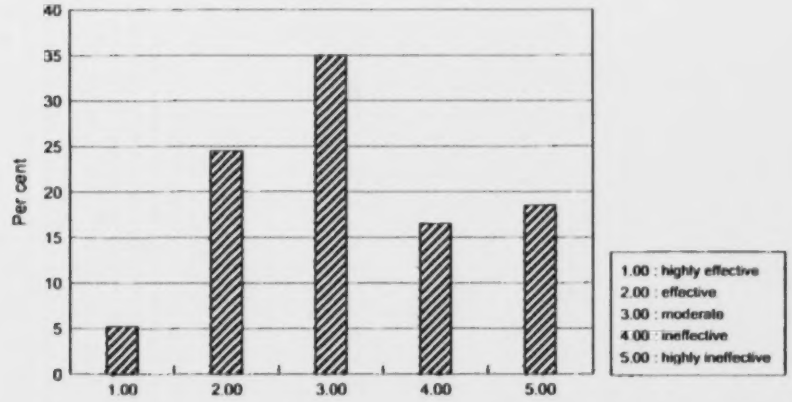


Figure 3.8: Group projects set by the teacher/facilitator

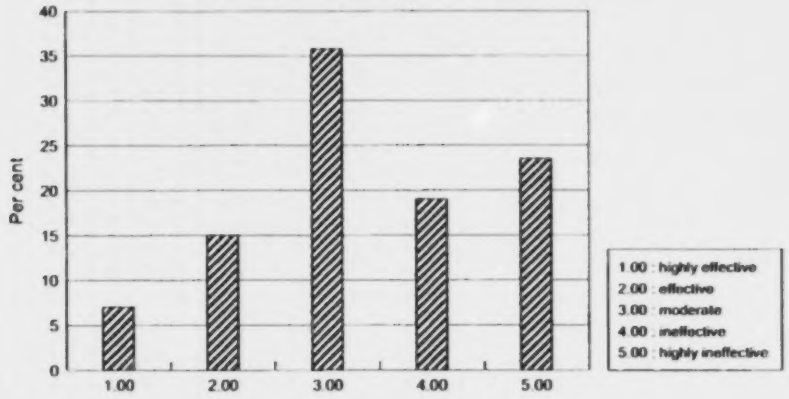


Figure 3.9: Collaboration arranged by the teacher/student

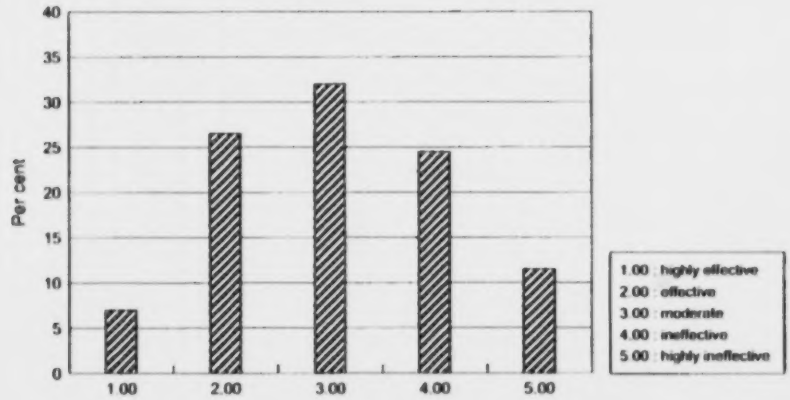
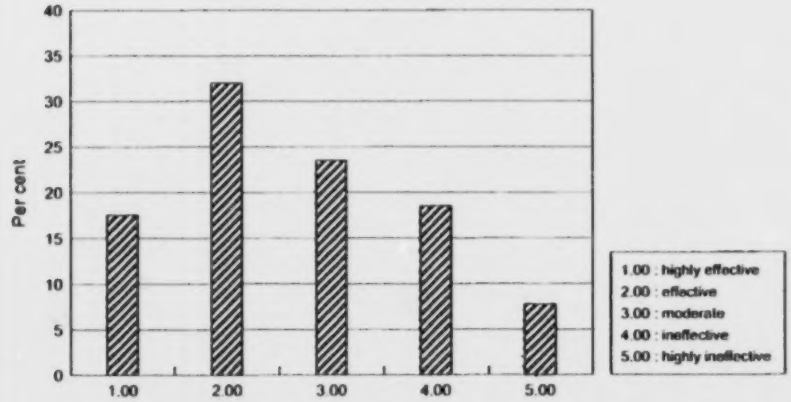


Figure 3.10: Discussion via bulletin boards or forums



Email was regarded as the most effective interaction in encouraging student online learning. Collaboration arranged by the teacher or student was given a mid-range ranking in terms of effectiveness. Discussion via bulletin boards or forums was also considered more effective than other forms.

Changes in teaching style

Teachers were asked to comment on the ways in which they had changed their teaching styles to accommodate online delivery.

Time management was regarded as a significant change made by teachers as they now did 'more at odd hours'. The hours spent in front of the computer was also a significant change.

A number commented that they had become more flexible and had learnt how to adapt online materials to the level and needs of the learner. Substantially more time was devoted to one-to-one interactions. Clear written communication skills were seen by other teachers as a change in the right direction. This was especially important where students came from a non-English-speaking background and relied on the printed word for directions, materials and support.

Other teachers commented that they had changed their 'mind-set' and had become more responsive and sensitive to student needs. They felt more creative with greater opportunities to experiment. A number mentioned that they had rethought how and why they teach. They had become 'advisors not instructors'.

Teachers felt that their levels of technological skills had changed as they moved to online teaching. Some teachers commented that their level of experience in online teaching did not allow them to monitor changes to practice. Others said that they were still in a process of change.

For those who did not feel that online delivery had changed their teaching practice, some had extensive experience with online delivery or had worked with information technology as their core business.

Advice to new online teachers

The advice that participants offered to new online teachers focussed on a number of themes. The importance of personal qualities such as patience, flexibility and persistence appeared regularly in their discussions. They suggested that teachers start with a small amount of online delivery and gradually develop their skills.

Teachers also felt that feedback to students was crucial and there was a need to 'work very hard at relationships'. Several suggested that teachers should complete an online course so that they could 'put themselves at the other end of the screen and imagine how the learner feels'. The need to be exploratory and a 'bit of a risk taker' was also considered to be good advice for new online teachers.

Management skills such as planning, student tracking and time allocations to ensure teacher survival were other pieces of advice. A large number of teachers suggested that a mentor for a new teacher was helpful as was 'working with a buddy or an experienced tutor'.

The following teaching strategies were believed to be useful for new teachers:

- building in regular feedback comments
- avoiding large chat sessions
- customising courses

- blending online delivery with other methods
- increased communication.

The advice to new teachers was summarised by one participant in the following way:

> Take time and prepare, take risks, enjoy the journey, share and communicate openly and give feedback. Persist, persevere and be patient with both the technology and the students.

Appendix 4: Survey results – students

The questionnaire was completed by 100 students.

Sixty-four per cent of these students were male and 36% were female; 60% of all students were studying full time and 40% part time; 37% were between 16 and 25 years of age and 43% between 31 and 50 years of age. Eighty-one per cent of the course modules being studied online were between Australian Qualifications Framework certificate 3 and advanced diploma levels. The courses and modules studied online were predominantly computer-related. Students relied most heavily on web-based course content and email to facilitate their online learning.

Experience of online learning

Most students described themselves as competent and experienced computer users and were positive about these experiences. However, the transferability of this confidence to an online learning environment was not confirmed by responses to other questions.

Those students with relatively high levels of computer efficacy working at the upper limits of VET sector Australian Qualifications Framework were asked to comment on the extent to which the features of effective pedagogy constituted part of their online learning experiences.

Table 4.1: My online course/learning:

	Seldom/ never %	Sometimes %	Usually %	Always %
Creates a learner-centred environment	15	50	25	11
Uses questioning strategies	12	55	28	6
Attempts to build a relationship between students	42	38	17	4
Actively engages me in my own learning	13	40	37	10
Employs motivational strategies	34	44	20	3
Monitors my progress on a regular basis	16	39	33	13
Provides me with timely and constructive feedback	16	42	32	10
Encourages critical thinking	23	41	25	12
Facilitates my learning	12	40	42	7
Encourages student debate and discussion	36	39	23	3
Provides guidelines about assessment and work schedules	5	30	46	19
Efficiently and effectively transmits content to me	13	28	46	13
Develops my analytical skills	9	58	23	10
Creates a sense of community amongst the students	37	21	21	2
Matches learning materials to my needs and learning style	18	55	20	6

Table 4.1 shows that, in the majority of cases, these features of pedagogy are 'sometimes' characteristic of their learning. The most effective features from the student perspective appear to be:

- providing guidelines about assessment and work schedules
- the effective and efficient transmission of content to them
- facilitating learning
- actively engaging them in their own learning
- providing constructive and timely feedback.

It is significant that, in 42% of the cases reported students claimed that building relationships amongst the online cohort was 'seldom or never' part of their experience.

Students also felt that their online learning/course matched their learning styles 'to some extent' or fairly well in 84% of the cases.

Students provided the following explanations for their attitudes towards the match between online learning and their own knowledge of how they learn best.

Table 4.2: Positive and negative aspects relating preferred learning styles to online learning approaches

Positive responses	Negative responses
✧ facilitates flexibility	✧ materials are too lock-step
✧ challenge of new ways of learning	✧ preference for print based materials
✧ speed of feedback	✧ scarcity of different learning methods to satisfy a variety of learning styles
✧ questions answered quickly	✧ easily distracted from online learning
✧ convenience of home access	✧ technical difficulties particularly with 'log ins'
✧ as a supplement to face-to-face [teaching] is an excellent way to learn	✧ learn best in a situation of class interaction
✧ opportunity for information to 'sink in'	✧ have to have a lot of motivation
✧ efficient	✧ reliance on the screen is difficult
✧ reliable	✧ complex subjects difficult
✧ self-directed learning	✧ need to be 'taught'
✧ take control of the process of learning	✧ no real interaction

Thirty-eight per cent of students maintained that online teaching is 'fairly' suitable to their subject area. They explained their responses to this question with comments similar to those given in table 4.2. The online environment provided convenience, access and flexibility. However, they also recognised that face-to-face classroom interaction was sadly lacking in computer-based learning and strongly advocated a blend of the two styles to gain maximum efficiency and learner satisfaction.

There was a convergence of the medium of delivery and content for those students enrolled in information technology courses: 'When learning about computers—the best tool is a computer'. Students enrolled in other courses and modules had completely different attitudes to suitability, and commented that complex concepts were difficult to grasp online and that technological problems often caused blockages to their learning.

Learner characteristics

New skills

The students surveyed were more visual than auditory learners, with relatively high levels of learner independence and confidence. They felt that they needed limited levels of supervision and that they

were self-motivated. Their literacy and numeracy skills were, on balance, well-developed and they were technologically competent. They were team players who enjoyed the communicative dimensions of learning. Online learning had required them to learn some new skills in:

- written communication
- time management
- use of the technology
- relationships with teachers and students
- stress management
- research
- typing
- analysis
- anger management
- reflection.

New roles

Students were asked to comment on their new roles as online learners. As table 4.3 indicates, their responses were both positive and negative.

Table 4.3: Positive and negative affects on the online learner role

Positive responses	Negative responses
part of a cohesive group	confused
confident	preference for more traditional roles
positive	frustrated
able to take advantage of options	sponge
active	lack of assistance
enthusiastic	difficult
	lonely
	passive
	unmotivated

The variety of responses confirms that learners' conceptions of their new roles are located along a continuum. While the majority of students regarded themselves as being technologically competent, there were a significant number who were unimpressed by their new learner status. Students had adjusted to online learning by spending more time with the technology. Some compensated for the lack of face-to-face contact by increasing their use of the email and the phone. While they appreciated the increased flexibility created by online learning, their new roles included coping with sometimes unstable and frustrating technology. Some students felt more self-sufficient as learners while others had lost considerable amounts of their self-confidence.

Advice to online students

The students surveyed provided the following advice to new online learners:

- be motivated and committed
- be organised about study and time

- ask questions
- build up skills
- be prepared to print material
- have regular contact with other students and the teacher
- have teenagers to help you
- remember your password.

Predominantly students were studying online for reasons of convenience, with the ultimate goal of increasing their employability.

A competent online learner

Students were asked to describe the features of a good online learner. These included a learner who is:

- organised
- self-motivated
- positive
- focussed
- independent
- patient
- a problem-solver
- full of fun
- brave
- a good communicator
- flexible
- full of perseverance
- comfortable with the electronic medium
- willing to have a go
- 'a passive doll with a photographic memory'
- literate.

The extent to which this matches the profile of VET students is a question worth asking and answering.

Results—teacher and student questionnaires

The analysis of both the teacher and student questionnaire results can be summarised as follows.

Students and teachers agreed that web-based course content and email were used most often to facilitate learning.

Students felt that the features of effective pedagogy are 'sometimes' characteristic of their learning. Teachers felt much more strongly that these features characterised their online teaching behaviour, although the strategies they used did not always support this commitment.

Students and teachers disagreed about the extent to which building online relationships was part of their experience. Teachers maintained that the behaviours they used online did this far more effectively than students reported.

Teachers reported that they could cater for students' learning preferences and styles 'sometimes/usually'. The student responses confirmed this report.

The student and teacher free responses to questions related to the match between online learning and student learning styles, and preferences indicated that teachers clearly appreciated the range of opinions that students held about the suitability of the medium for effective learning.

Teachers and students agreed that online teaching is 'fairly suitable' to the subject area. The teacher and student issues raised to support the ranking showed a remarkable equivalence. Both groups surveyed recognised that, where content and delivery method were complementary, as with information technology, suitability increased. In the case of complex concepts or discussion-based and values-oriented content, face-to-face communication and interaction does not transfer well to an online environment.

Teachers and students agreed that online delivery had led to the acquisition of new skills. The teacher skills were more strongly clustered around using the technology than was the case with the students. Both survey groups recognised the importance of developing personal/affective skills to cope with the sometimes frustrating idiosyncrasies of the technology.

Students' descriptions of their new roles were both positive and negative. Teachers' responses were more focussed on the possibilities for facilitating, motivating, mentoring and guiding students' learning. However 'inexperienced' or 'average' teachers were decidedly less enthusiastic and expressed feelings of frustration at their apparently deprofessionalised status.

Both teachers and students agreed that a mixture of online and face-to-face teaching was the ideal as it allowed for both flexibility and communication.

Appendix 5: Analysis of the online course filter

Introduction

A number of at-desk activities were carried out in conjunction with other data collection strategies in this project. These activities were designed to complement the information gathered from teachers and students via the questionnaires and focus groups. Research team members were asked to access a variety of online course sites. These sites were selected to ensure coverage of:

- Australian Qualifications Framework levels
- accredited/non-accredited courses
- content areas
- learner levels.

The team members came from a variety of backgrounds and all had expertise in both online delivery and online learning. They were briefed about the purpose of the activity and all were aware of the results of other phases of the project.

The results

The courses were chosen to represent a variety of offerings at different levels (see table 5.1). Some courses were fully online while others were used primarily as a resource to supplement face-to-face teaching. The unifying feature of these courses was that students were expected to be learning using computer technology.

The questions

The online course filter questions (appendix 8) were generated on the basis of what we wanted to know about a range of deliberately selected online courses. Online pedagogy is an interface between the teacher/facilitator, the student and the electronic course materials. It was therefore imperative to test an analysis of content and materials against the information about what constitutes sound online pedagogy gathered via the interviews and focus groups.

Analysis

Types of technology used to deliver content

Respondents were asked to place a percentage value beside each feature of technology delivery for the particular course they were analysing.

Table 5.1: Online courses

No.	Course title and description	Intended audience	Australian design		Accredited			AQF level
			Y	N	Y	N	U	
1	Virtual Independent Learning Centre Online resource for providers, schools and individuals	Adult Migrant Education Program students, non-English-speaking (NESB) students learning English at all levels	•			•		Not applicable
2	Beginning Indonesian Practice & review exercises for students	English-speaking students learning Indonesian at uni level		•		•		Not applicable
3	Online Office Computing—7365DD—Toolbox Database/spreadsheet Fundamentals/word processing	TAFE students	•		•			2
4	Guide to Children's Behaviour Designed to help students enrolled in subject CHCIC2A	TAFE Diploma of Community Services students	•				•	5
5	Cybermall Shopping in English—language learning/ enrichment	NESB students learning English at advanced level	•			•		Not applicable
6	Building & Construction online Theory lessons to supplement face-to-face instruction	TAFE building & construction students	•		•			1
7	The World of Work Online resource designed to provide vocational skills—based on modules from Cert I in Work Education (Victoria)	Young adults (16+) with mild intellectual or psychiatric disabilities	•		•			1
8	Commercial Law Principles NAP750 is a core subject in most Business Studies courses	TAFE students in business studies, admin & mgt	•		•			A range of AQF levels
9	Virtual Campus Online Content—Building & Construction Six competencies from the general Construction Training Package, AQF 1 & 2	Apprentices, pre-apprentices	•		•			1–2
10	Train Small Groups Practical subject that develops skills & knowledge in workplace coaching or deliver training to small groups	Pilot program for 18–24 students in hospitality diploma during a nine-month work placement	•		•			Diploma Level 5
11	Masters Science (Library & Information Science) Theory & practice in LIS	Graduate tertiary students intending to work in libraries		•	•			Level 7/8

Table 5.2: Types of technology used to deliver content (%)

Course no.	Text	Graphics	Video	Sound	Email	Bulletin boards & forums	Hyper links	Cartoons	Virtual class rooms & libraries	Virtual work places
1	30	10		20	10			10	20	
2	50	50								
3	40	20	5	-	10	5	5	5	-	-
4	85	5			10					
5	55	20		20			5			
6	80	10					5			5
7	15	10		5			5	10		60
8	35	35		10		10	10			
9	45	10			5	20		15		5
10	60				15	5	5	15		
11	61					8			31	

The percentage scores for each feature were added together and then divided by 10 to give a weighting for each feature within the overall set of courses analysed.

Table 5.3: Frequency of types of delivery

Feature of delivery	Weighting	Ranking
Text	55.6	1
Email	7.0	2
Virtual workplaces	6.5	3
Cartoons	5.5	4
Chat rooms	5.5	4
Sound	5.5	4
Virtual classrooms & libraries	5.1	5
Bulletin boards & forums	4.8	6
Hyperlinks	3.5	7
Video	0.5	8

All courses relied heavily on text-based delivery with a relative weighting of 55.6. The remainder of the features of content delivery are clustered between the weightings of 0.5 and 7. Communication (email) and interaction (chat rooms, bulletin boards and forums) are located a relatively long distance from text-based delivery.

Table 5.4: Level of self-management required by the learners

Course no.	Comments
1	Designed for a continuum from teacher-assisted to completely self-directed
2	Total—no interactivity, automatically marked drill and practice exercises
3	Well designed—easy to use—linear and sequential
4	Very high
5	Total
6	Need to progress complete self-assessment and move on.
7	Given the target audience, the resource is mainly designed for teacher-led use. However, the ease of navigation and clear design structure should not present any difficulties if the resource were to be used in a learner-centred manner.
8	Learners are required to manage their own direction through the content but in terms of technical maintenance, the learner has no responsibility.
9	Some, by virtue of the fact that it is online.
10	Students were required to manage their studies independently; however, they had access to the teacher at all times. I would say that there was a high level of self management required this could be attributed to the fact that students didn't contact the lecturer often and failed to participate in many of the forums and chats.
11	Students would need to be good participants to manage the course. High level of organisation, time management and interactivity required.

All courses required some learner self-management. Three courses (1, 3 and 7) could be 'teacher-led' and this reduced the pressure on students to monitor their own progress. The remaining eight courses required mid-range to high levels of learner self-management. The learners in these courses needed to be organised, use time-management strategies, contend with the technology, engage in self-assessment tasks and participate in interactive exchanges with the teacher/lecturer.

Table 5.5: Level of persistence required by learners

Course no.	Low	Medium	High	Comments
1			•	Difficult to ascertain—full range.
2		•		After introductory unit all instructions are in Indonesian.
3			•	Students need to work through modules independently.
4			•	Because of 'double' set up, both CD-ROM and site to be mastered.
5	•			Student completely self-directed.
6				Student uses this as an adjunct to face-to-face.
7	•			The course has been designed to allow teachers or learners to use small 'chunks' for delivery of specific topics, or continuously work through larger sections in a 'storybook' fashion. Subsequently, the content flows together and persistence is not a major necessity.
8		•		This is not intended as a totally online course: if a learner were to approach it as such, their persistence would depend on their individual personality.
9	•			Has been designed to be used in a guided environment, and to be accessible.
10			•	
11			•	There is a wide range of web-based technologies the student needs to master; interactivity with lecturer & class level is high.

Persistence

Three courses required low levels of learner persistence. The reasons given for the low level of persistence required were:

- Course 6 – materials used as an adjunct to face-to-face instruction
- Course 7 – a 'teacher-led' course
- Course 8 – designed specifically to be used in a guided environment.

Two courses required medium levels of learner persistence. The reasons given for the medium level of persistence required were:

- Course 3 – learner independence
- Course 9 – not a totally online course; teacher support available.

Five courses required high levels of learner persistence. The reasons given were:

- Course 2 – language difficulties
- Course 4 – two forms of technology to be mastered
- Course 5 – student completely self-directed
- Course 10 – independent study with access to teacher requires high level of self-management
- Course 11 – wide range of web technologies to be mastered; interactivity is high and consistent.

One course was difficult to rank in terms of learner persistence because of the range of students involved.

Courses which were an adjunct to face-to-face instruction or which were specifically designed to support students required lower levels of student persistence than those where the learning activities required higher degrees of learner independence.

High levels of learner persistence were required in courses displaying the following features:

- materials requiring high levels of self-management
- course utilising complex technologies
- language of instruction
- materials requiring student to be highly self-directed
- high levels of interactivity.

Table 5.6: Levels of interactivity embedded in the course/content

Course no.	Comments
1	Interactivity could be encouraged when it is used in a classroom context, but is not a feature per se.
2	Nil
3	Chat/forum/announcement sections are interactive; email available; facilitators highly available.
4	This seems limited (difficult to tell since access to website needed)
5	Nil
6	Virtually none
7	The majority of content is presented as scenarios that require the learner to identify the appropriate course of action or access further information about the particular situation. In addition, each chapter concludes with a 'games room', containing a variety of small interactive activities.
8	Quizzes (multiple choice, true/false, drag and drop), case book narrative tool; mouseovers, pop-ups, audio glossary, discussion starters.
9	Mouseovers, exploratory activities, quizzing.
10	The platform has many features that promote interactivity, in particular the discussion boards and virtual classroom; these features enable students to interact with each other and with the teacher. The program also provides facilities that teachers can use in course design such as web quests and video and audio clips and images.
11	High levels, chat on webboard, comments on other students' work, group work—weekly synchronous 2 hr.

Interactivity

Email, chat rooms, bulletin boards and forums were weighted as 7.0, 5.5 and 4.8 respectively. By comparison to the 55.6 weighting for text-based delivery, these forms of interactivity are relatively limited. These results are confirmed, with 8 of the 11 courses reporting low, limited or game-based interactive activities. The three courses that reported higher levels of interactivity (3, 10 and 11) had active facilitators and assessment tasks organised around the interactions.

Table 5.7: Level of self-monitoring embedded in the course

Course no.	Low	Medium	High
1		•	
2			•
3		•	
4			•
5			•
6		•	
7	•		
8		•	
9		•	
10		•	
11			•

Self-monitoring

Ten of the eleven courses analysed required medium-to-high levels of student self-monitoring.

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Table 5.8: Forms of assessment

Course no.	Assessment forms
1	Not really the purpose of the Virtual ILC
2	Number of correct answers in exercises
3	Electronic assessment items & submission; cartoon & activity-based assessment items occur throughout the modules.
4	If participating as part of an accredited course assessment at worksite, otherwise through response to activities.
5	Comprehension style, short answer questions
6	Multiple-choice answers
7	The 'teacher-led' design implies that assessment would occur by observation of learners' progress through the resource. In addition, various games prompt learners to either participate in a classroom activity or submit an activity to their teachers.
8	Self-assessment occurs at the end of each major knowledge 'chunk' in the form of different quiz types.
9	Practical tasks suggested in the tutor guide.
10	Worksheets, online quizzes, discussion boards, oral presentation (videoed and submitted).
11	Report on observation, listserv report & monitoring, group development of a website that is peer evaluated online.

The forms of assessment in the courses analysed include:

- self-assessment
- activity-based assessment
- worksite assessment
- multiple-choice comprehension
- assessment via interaction.

Those courses with higher levels of interactivity and teacher-led design (3, 7, 10 and 11) reported more varied assessment items with high levels of teacher feedback. The remaining seven courses relied on embedded computer-marked, multiple-choice and comprehension questions with some opportunities for practical exercises to be carried out in the workplace.

Table 5.9: Assumptions made about the learners

Course no.	Assumptions
1	All levels catered for, although beginners will need more guidance.
2	Using it as a review/study for students enrolled in Indonesian language courses.
3	Follow lessons sequentially; reasonably competent IT users; have time and inclination to join in.
4	Highly technologically literate
5	That they can both read and write well in English.
6	Literate, enjoy 'lock-step' and have basic computing knowledge.
7	Learning occurs in a supportive environment; language/literacy level is relatively low; a variety of teaching strategies are employed.
8	That learners will be using this course primarily for revision, and that learners will have teacher support throughout.
9	Do not like reading, will have practical class time, will be assessed offline.
10	Several assumptions have been made about the learners in the course; these included the level of computer literacy of the learners, as students had completed a basic computer course at college and they had been exposed to Blackboard during their early training at the college. It became clearly evident during the early stages of the course that students didn't have the skills that they needed to carry out the work. The other big assumption was that of the learners' ability to be self-directed; students were not prepared for this and consequently many students dropped out of the course and in general found it difficult to manage their time effectively.
11	Highly motivated, high academic achievers, technologically 'switched on'.

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The courses assumed that the participating online learners are:

- ✧ technologically competent (7)
- ✧ literate and numerate (8)
- ✧ using the course for revision (3)
- ✧ self-directed (5)
- ✧ low-level English language users (2).

Table 5.10: Forms of feedback

Course no.	Forms of feedback
1	Feedback is provided within classroom settings, not by the Virtual ILC itself.
2	Exercises are marked and numerical score is given.
3	Notes and conversational tone throughout and formative assessment items are immediately marked, email, forum, chat, ability to check progress at anytime.
4	Limited—set up with expectation of direct teacher support.
5	Nil
6	Computer-generated feedback
7	All quiz items, games and other situations requiring learners to make decisions provide appropriate feedback.
8	Feedback via quizzes
9	Verbose feedback in online quizzing, activities often require student/teacher interaction.
10	Emails were sent to the students every week and chat sessions were set up twice a week; found that students didn't tap into the communication channels that were set up for their benefit; therefore difficult to provide as much feedback as hoped; students emailed on a group basis and then on a personal level to check on their progress; students were also given written and verbal feedback on their course work.
11	Weekly chat sessions in webboard, between students, assessment task, reading journal activities contribute to class participation marks.

The forms of feedback that online learners receive in these courses varied from computer-generated responses to assessment items (7), to intensive teacher interaction via email, webboards, online quizzes and chat sessions (4).

The elements of sound pedagogical online practice were listed and the team members were asked to rank these on a scale of one to seven, where seven was the highest ranking and one the lowest ranking.

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Table 5.11: Rating of courses 1–6 in relation to the key pedagogical principles (PEIs)

	Pedagogical principles	Course number					
		1	2	3	4	5	6
		Ranking (1–7)					
1	The course creates a learner-centred environment.	7	1	4	2	1	2
2	The course uses constructivist approaches to teaching & learning.	7	1	3	2	1	2
3	The course is characterised by high-quality materials design.	7	4	5	1	1	3
4	The teaching and learning strategies used in the course foster the development of cognitive skills.	7	1	4	1	1	2
5	The course encourages high levels of interactivity among participants.	0	1	3	1	1	1
6	The course encourages an engagement with the online materials.	7	7	3	3	2	1
7	The learning experiences embedded in the course encourage synthesis and analysis.	4	1	2	2	1	1
8	The course creates opportunities for 'deep learning'.	5	1	1	2	1	1
9	The course provides consistent levels of feedback.	0	1	4	1	1	3
10	The course accommodates a diverse set of matches between materials, learning styles and learning contexts.	7	1	3	3	1	2
11	The course is designed using a model of delivery that includes thorough planning, monitoring, reviewing and evaluating of course materials and student progress.	7	1	4	1	1	2
12	The course provides a range of available navigational choices for students.	7	3	3	4	1	2
13	The course treats content differently and at various levels of sophistication depending on the prior knowledge of the learner.	7	1	2	2	1	2
14	The course provides appropriate feedback and opportunities for review and self-testing.	0	4	5	2	1	4
15	The course offers shortcuts for those who are time poor or already competent.	6	7	3	1	1	3

Table 5.12: Rating of courses 7–11 in relation to the key pedagogical principles (PEIs)

	Pedagogical principles	Course number				
		7	8	9	10	11
		Ranking (1-7)				
1	The course creates a learner-centred environment.	7	5	4	4	7
2	The course uses constructivist approaches to teaching and learning.	1	1	5	3	6
3	The course is characterised by high quality materials design.	7	6	6	4	6
4	The teaching and learning strategies used in the course foster the development of cognitive skills.	2	4	6	4	6
5	The course encourages high levels of interactivity among participants.	5	5	6	3	7
6	The course encourages an engagement with the online materials.	7	5	6	5	7
7	The learning experiences embedded in the course encourage synthesis and analysis.	2	1	5	5	6
8	The course creates opportunities for 'deep learning'.	1	2	5	6	6
9	The course provides consistent levels of feedback.	7	5	6	6	6
10	The course accommodates a diverse set of matches between materials, learning styles and learning contexts.	5	3	5	4	6
11	The course is designed using a model of delivery that includes thorough planning, monitoring, reviewing and evaluating of course materials and student progress.	6	3	6	6	5
12	The course provides a range of available navigational choices for students.	1	7	4	3	4
13	The course treats content differently and at various levels of sophistication depending on the prior knowledge of the learner.	4	5	4	4	5
14	The course provides appropriate feedback and opportunities for review and self-testing.	6	6	6	5	4
15	The course offers shortcuts for those who are time poor or already competent.	7	5	6	2	4

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Pedagogical effectiveness indicators (PEIs)

The pedagogical effectiveness indicators were generated from the literature review, the interviews and the focus groups. The team members were asked to rate the courses on a scale from one to seven according to how well the course both displayed and embedded these indicators. The higher the overall rating of the course, the more pedagogically effective it was likely to be. The highest ranking possible where all indicators of pedagogical effectiveness were present was 105.

Table 5.13: Ranking of courses according to indicators of pedagogical effectiveness

Course no.	AQF level	PEI ranked score
1	-	78
2	-	32
3	2	49
4	5	28
5	-	16
6	1	31
7	1	68
8	a range	63
9	1/2	80
10	5	64
11	7/8	85

Table 5.14: Ranking of course to show relationship between percentage of text online and pedagogical effectiveness

Course no.	Text %	Pedagogical effectiveness ranking
1	30	78
2	50	32
3	40	49
4	85	28
5	55	16
6	80	31
7	15	68
8	35	63
9	45	80
10	60	64
11	61	85

Summary

The courses analysed represent a range of online offerings designed for different audiences, Australian Qualifications Framework levels, and content areas. The general trends that emerge about the implicit pedagogies that underpin these courses include:

- ✧ Text is the predominant feature of online delivery.
- ✧ Communication and interactivity constitute a relatively small proportion of the total online activities required of the learner.
- ✧ Some degree of learner self-management is needed in all the courses, with medium-to-high levels being an important prerequisite for success.
- ✧ High and medium levels of student self-monitoring are required.
- ✧ Assessment is 'mechanical' in courses where there is limited teacher support and interaction.

- Courses assume technological competence and teacher support in a face-to-face or online environment.
- The type of feedback students receive is contingent on the level of teacher support.
- The indicators suggest that courses display a wide range of pedagogical effectiveness.

The characteristics of courses that suggest relatively higher levels of pedagogical effectiveness (ranking 65–105) include:

- designed for specific audiences with identifiable characteristics at both ends of the learning ability continuum
- high levels of feedback in a variety of forms
- high levels of teacher interaction and support
- a range of self-monitoring levels
- guidance levels high—students will need and receive support
- a range of activities to engage a variety of student learning styles and preferences
- developmental, active and formative assessment strategies.

The characteristics of courses that suggest relatively mid-range levels of pedagogical effectiveness (ranking 64–50):

- self-management levels relatively higher
- levels of learner persistence required medium to high
- interactivity in the form of games, quizzes, student to student, and student–teacher
- contact
- medium levels of self-monitoring

The characteristics of courses that suggest relatively low levels of pedagogical effectiveness (ranking 49–0) include:

- high levels of learner self-management
- higher levels of text-based delivery
- high levels of persistence where face-to-face teaching is involved
- interactivity absent in all but one course
- high-to-medium levels of self-monitoring
- restricted assessment strategies
- learners assumed to be technologically literate
- computer-generated feedback.

Appendix 6: Applying the framework

Elements of productive pedagogies

The chapter entitled 'A framework for online pedagogy' in volume 1 of this report describes the development of the pedagogical effectiveness indicators (PEIs) for online learning and has listed the four dimensions of 'productive pedagogies' as: 'intellectual quality, relevance, supportive classroom environment and recognition of difference'.[1]

The first of these establishes the principle 'that a focus on high quality is necessary for all students to perform academically'.[2] Relevance refers to the way in which the knowledge that is presented is integrated or related to another body of knowledge or experience. The ideal of a supportive classroom environment is based on extensive research and introduces the concept 'that students require a supportive classroom environment if they are to achieve what teachers ask of them'.[3] The fourth dimension of the productive pedagogies paradigm is concerned with the recognition of difference and how this difference is acknowledged through language, narrative and text type.

Each of the dimensions of effective pedagogy generates a set of questions that can be used to interrogate available data and current practice. These questions appear below. The answers reflect the relative strengths and weaknesses of online pedagogy in VET, and were used to inform questions used in the interviews, workshops and surveys.

Intellectual quality

- *Higher-order thinking:* Is higher-order thinking occurring during the lesson? That is, is there evidence of conceptual depth, not merely content?
- *Deep knowledge:* Does the lesson cover operational field in any depth, detail or level of specificity?
- *Deep understanding:* Does the work and response of the students provide evidence of depth of understanding of concepts or ideas?
- *Substantive conversation:* Does classroom talk lead to sustained conversational dialogue between students, and between teachers and students, to create or negotiate understanding of subject matter?
- *Knowledge as problematic:* Are students critiquing and second-guessing texts, ideas and knowledge?
- *Meta-language:* Are aspects of language, grammar and technical vocabulary being foregrounded?

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[1] Ailwood, J, Grant, D, Gore, J, Hayes, D, Ladwig, J, Lingard, B, Luke, A, Mills, M & Warry, M 2000, 'The four dimensions of productive pedagogies: Narratives and findings from the Queensland school reform longitudinal study', paper presented to AERA Conference, New Orleans, 24–28 April.

[2] Ailwood et al. 2000, p.11.

[3] Ailwood et al. 2000, p.13.

Relevance/connectedness

- *Knowledge integration:* Does the lesson integrate a range of subject areas?
- *Background knowledge:* Are links with students' background knowledge made explicit?
- *Connectedness to the world:* Is the lesson, activity, or task connected to competencies or concerns beyond the classroom?
- *Problem-based curriculum:* Is there a focus on identifying and solving intellectual and/or real-world problems?

Supportive classroom environment

- *Student direction:* Do students determine specific activities or outcomes of the lesson?
- *Social support:* Is the classroom characterised by an atmosphere of mutual respect and support among teacher and students?
- *Academic engagement:* Are students engaged and on task during the lesson?
- *Explicit quality performance criteria:* Are the criteria for judging the range of student performance made explicit?
- *Self-regulation:* Is the direction of student behaviour implicit and self-regulatory?

Recognition of difference

- *Cultural knowledges:* Are non-dominant cultural knowledges valued?
- *Inclusivity:* Are deliberate attempts made to increase the participation of the range of students?
- *Narrative:* Is the style of teaching principally narrative or is it expository?
- *Group identity:* Does the teaching build a sense of community and identity?
- *Active citizenship:* Are attempts made to encourage active citizenship within the classroom?

Applying the productive pedagogies framework

The final set of results came from overlaying the productive pedagogies framework on the qualitative data collected. In summary *the presence of all within a lesson will contribute to the practice of a productive pedagogy*. The methodology for assessing the presence of these productive pedagogies online is explained in the chapter entitled 'A framework for online pedagogy' in volume 1 of this report. The question which this process addressed was:

> To what extent does the data collected indicate that the dimensions and sub scales of productive pedagogies characterise the online delivery of VET?

The results of this process appear below.

Table 6.1: Dimensions of productive pedagogies

	Comments	
	R1	R2
Intellectual quality		
Dimensions—deep knowledge	X	XX
Deep understanding	X	X
Higher order thinking	X	X
Substantive conversation	X	X
Meta-language	X	X
Knowledge as problematic	X n/k	X
Relevance		
Dimensions—background knowledge	X	X
Problem-based curriculum	X	X
Connectedness	X	X
Knowledge integration	X n/k	X

Notes: X = limited match; XX = moderate match; XXX = strong match; XXXX = very strong match; p/n = probably not conjecturing on evidence; n/k = not known from the evidence

	Comments	
	R1	R2
Supportive classroom environment		
Dimensions—student self-regulation	X	X
Social support	X n/k	X
Explicit criteria	X	XX
Student direction	X	
Academic engagement	XX	XX
Recognition of difference		
Dimensions—industry	n/k	n/k
Narrative	X n/k	X
Cultural knowledge	X n/k	X
Citizenship	X n/k	X
Group identity	XXX	XX

Notes: X = limited match; XX = moderate match; XXX = strong match; XXXX = very strong match; p/n = probably not conjecturing on evidence; n/k = not known from the evidence

Table 6.2: Dimensions of productive pedagogies

	Comments	
	R1	R2
Intellectual quality		
Dimensions—deep knowledge	X	X
Deep understanding	X	X
Higher order thinking	X	X
Substantive conversation	X	X
Meta-language	n/k	X
Knowledge as problematic	p/n	X
Relevance		
Dimensions—background knowledge	X	X
Problem-based curriculum	n/k	X
Connectedness	n/k	n/k
Knowledge integration	n/k	n/k

Notes: X = limited match; XX = moderate match; XXX = strong match; XXXX = very strong match; p/n = probably not conjecturing on evidence; n/k = not known from the evidence

	Comments	
	R1	R2
Supportive classroom environment		
Dimensions—student self-regulation	XX	XX
Social support	X	X
Explicit criteria	X	X
Student direction	X n/k	X
Academic engagement	XX	XX
Recognition of difference		
Dimensions—industry	X n/k	X
Narrative	X n/k	X
Cultural knowledge	X n/k	X
Citizenship	X n/k	X
Group identity	X n/k	X

Notes: X = limited match; XX = moderate match; XXX = strong match; XXXX = very strong match; p/n = probably not conjecturing on evidence; n/k = not known from the evidence

Table 6.3: Dimensions of productive pedagogies

	Comments	
	R1	R2
Intellectual quality		
Dimensions—deep knowledge	XXX	XX
Deep understanding	XXX	XX
Higher order thinking	XXX	XX
Substantive conversation	XX	XX
Meta-language	X n/k	X
Knowledge as problematic	XX	X
Relevance		
Dimensions—background knowledge	X	X
Problem based curriculum	XXX	XX
Connectedness	X	X
Knowledge integration	X n/k	X

Notes: X = limited match; XX = moderate match; XXX = strong match; XXXX = very strong match; p/n = probably not conjecturing on evidence; n/k = not known from the evidence

	Comments	
	R1	R2
Supportive classroom environment		
Dimensions—student self-regulation	X	X
Social support	XX	XX
Explicit criteria	X	XX
Student direction	XX	X
Academic engagement	XX	XX
Recognition of difference		
Dimensions—industry	XX	X
Narrative	X n/k	X
Cultural knowledge	X n/k	X
Citizenship	X n/k	X
Group identity	XXX	XX

Notes: X = limited match; XX = moderate match; XXX = strong match; XXXX = very strong match; p/n = probably not conjecturing on evidence; n/k = not known from the evidence

From the tables above, the qualitative data indicated that the characteristics of online pedagogy match the dimensions of productive pedagogies to the following extent.

Intellectual quality

- Higher-order thinking
  There is limited-to-moderate evidence to support the assertion that conceptual depth, not merely content is being encouraged in the online environment.
- Deep knowledge
  The data show that deep knowledge where operational fields [are covered] in any depth or level of specificity varies between a limited and strong match.

- Deep understanding
  'The work and response of students provides' a limited to strong indication 'of depth of understanding of concepts or ideas'.
- Substantive conversations
  The data indicate that online teaching and learning leads to limited or moderate opportunities for 'sustained conversational dialogue between students and between teachers and students, to create or negotiate understanding of the subject matter'.
- Knowledge as problematic
  In an online environment students are 'critiquing and second guessing texts, ideas and knowledge' to a limited extent. The evidence is unclear on this issue.
- Meta-language
  The extent to which 'aspects of language, grammar and technical vocabulary [are] being foregrounded' in an online environment is either not known or limited.

Relevance/connectedness

- Knowledge and integration
  Online pedagogy 'integrates a range of subject areas' to a limited extent.
- Problem-based curriculum
  The data show that online pedagogy focusses 'on identifying and solving intellectual and/or real world problems' in a limited to strong way.
- Connectedness
  Online pedagogy connects 'to competencies or concerns beyond the classroom' in either a limited way or in ways that have not yet been discussed or evaluated.
- Background knowledge
  The extent to which the data indicate that online pedagogy 'links students' background knowledge' explicitly with new learning is limited.

Supportive classroom environment

- Student direction
  The extent to which the evidence suggests that 'students determine specific activities or outcomes of the lesson' in an online environment is limited to moderate.
- Social support
  The data indicate that 'the classroom is characterised by an atmosphere of mutual respect and support among teachers and students' to a limited to moderate extent.
- Academic engagement
  Online pedagogy is characterised by 'students engaged and on task during the lesson' to a moderate degree.
- Explicit quality performance
  The extent to which 'the criteria for judging the range of student performance [are] made explicit' is in the limited to moderate range.
- Narrative
  The degree to which the pedagogy of online delivery is either 'narrative or expository' is either not evident from the data or limited.
- Group identity
  Online delivery 'builds a sense of community and identity' in some 'strong' ways.
- Active citizenship
  The extent to which the online environment encourages 'active citizenship' amongst the learners is either unclear or limited.

Summary

In all instances there was a less than 'very strong' match between what the qualitative data suggested about online pedagogy and what the research indicates constitutes effective pedagogy.

Some dimensions of online pedagogy do demonstrate a 'strong' match with the features of productive pedagogies. These are in the areas of:

- deep knowledge acquisition
- deep understanding
- problem-based curriculum
- group identity.

However, it should be noted that these matches were not unequivocal, and the range of responses varied from 'limited' to 'strong'.

The dimensions of online pedagogy which demonstrated a 'moderate' match with the dimensions of productive pedagogies are:

- higher conversations
- substantive direction
- student direction
- social support
- academic engagement
- explicit quality performance
- self-regulation.

Again it should be noted that the evidence suggests that these 'moderately' ranked dimensions are equivocal and are weighted more to the 'limited' end of the scale in all cases.

The following characteristics of productive pedagogies are either present in an unequivocally 'limited' way or 'not known' from the data:

- knowledge as problematic
- meta-language
- knowledge integration
- connectedness
- background knowledge
- cultural knowledges
- inclusivity
- narrative
- active citizenship.

The qualitative data analysis therefore suggests that if online pedagogy is to become more 'productive' and effective for VET students, all the dimensions of pedagogy need to be addressed in the design and delivery of online materials. In particular:

- The cultural dimensions of learning require attention.

- The capacity of the online environment to cater for and build on cultural difference in an inclusive way needs to be embedded into delivery.
- The online environment must develop pedagogies that value difference and that begin with valuing the student knowledge base.
- The transference of strategies to include students with disabilities in online learning is an issue that requires will and talent.
- The critical skills of information and functional literacy need to be accepted as integral parts of online pedagogy.
- The social dimensions of learning and the encouragement of democratic learning practices require detailed attention in this environment.

The evidence suggests that some innovative practices are working towards the creation of a productive pedagogical environment. The move from predominantly text-based delivery to more interactive forms of student engagement is a sound beginning. However, this trend must be supported by equivalent attention to the dimensions of pedagogy which are relatively underdeveloped or non-existent in this environment. The capacity of present technology to facilitate these changes is a contestable question.

In the VET context, communication skills and the key competencies are expected to be embedded in training packages. The evidence suggests that beyond 'conversation', very few communication skills have the opportunity to surface. Similarly, the key competency of 'using technology' is present in online delivery by definition. However, the other key competencies receive very little explicit or implicit attention.

Appendix 7: Questionnaire consent and information forms

CHARLES STURT
UNIVERSITY

Project Title: **One size doesn't fit all: Pedagogy in the online environment**

CONSENT FORM

- I have received information about this research project.
- I understand the purpose of the research project and my involvement in it.
- I understand that I may withdraw from the research project at any time.
- I understand that while information gained during the study may be published, I will not be identified and my personal results will remain confidential. My organisation may be identified only with the consent of all parties.

This study has been approved by Charles Sturt University's Ethics in Human Research Committee.

I understand that if I have any complaints or concerns about this study, I can contact the Executive Officer whose address and phone number are shown on the Information Sheet I have been given.

Name of participant _____

Signed _____ Date _____

CHARLES STURT
UNIVERSITY

Project Title: **One size doesn't fit all: Pedagogy in the online environment**

INFORMATION SHEET

Thank you for helping with this research project. Your responses to the following questionnaire will help us to build up a picture of what effective online teaching is.

The focus on online delivery of VET in Australia is clearly supported by both policy and funding. As the use of this new training medium increases so too does the issue of emerging online pedagogy. How online materials are delivered; how teachers regard their roles; and how students learn in the online environment are the crucial research questions we are addressing in this particular project.

The first step of the study was to review relevant literature and then interview people working in the policy development and implementation of online delivery of VET in Australia about their responses to the issues raised in the literature. Based on the results of this review and subsequent interviews, the following questionnaire was developed in order to gain a clearer picture of teaching and learning online.

Participants in this stage of the project are asked to complete the questionnaire and consent form and return them to the researchers at:

Att: Ros Brennan/Judy Geeves
School of Education - Charles Sturt University
PO Box 588
WAGGA WAGGA NSW 2650

All surveys and consent forms will be stored securely and separately and treated confidentially by Roslin Brennan, the Principal Researcher, and her contact details are (02) 6933 2740 or rbrennan@csu.edu.au.

This project has been approved by Charles Sturt University's Ethics in Human Research Committee. If you have any complaints about the ethical conduct of this project, you may contact the Committee through the Executive Officer.

The Executive Officer
Ethics in Human Research Committee
The Grange
Charles Sturt University
BATHURST NSW 2795
Phone: (02) 6338 4187
Fax: (02) 6338 4833

Appendix 8: Questions for the online course filter

1. Site address .....
2. Access date .....
3. Course title .....
4. Course description .....
5. Intended audience for the course .....
6. Australian designed ..... Yes or No
7. If No to question 6 ..... Country of origin
8. Accredited or non accredited ..... Yes or No
9. If Yes to question 8 to what level in the AQF .....
10. Ease of access to the site ..... Please comment
11. Ease of navigation around the site ..... Please comment
12. Types of technology used to deliver content
(please place a percentage value beside each category based on calculations that relate to the whole course):

text	bulletin boards and forums .....
graphics	links to other net based resources .....
video clips	cartoons .....
sound	virtual classrooms and libraries .....
email	virtual workplaces .....
chat	

13. Level of self management required by the learners ..... Please comment
14. Level of persistence required by learners to proceed with the course ..... Please comment.
15. Forms of interactivity embedded into the course ..... Please specify
16. Level of self monitoring embedded into the course .....
17. Forms of assessment accompanying the course ..... Please list
18. Assumptions made about the nature of the learners by this course ..... Please list
19. Types of feedback provided to participants in the course .....

On a continuum of 1 to 7 (where 7 is the highest ranking and 1 is the lowest) rank this course in terms of the following statements:

a) The course creates a learner centred environment

b) The course uses constructivist approaches to teaching and learning

c) The course is characterised by high quality materials design

d) The teaching and learning strategies used in the course foster the development of cognitive skills

e) The course encourages high levels of interactivity among participants

f) The course encourages an engagement with the online materials

g) The learning experiences embedded in the course encourage synthesis and analysis

h) The course creates opportunities for 'deep learning'

i) The course provides consistent levels of feedback

j) The course accommodates a diverse set of matches between materials, learning styles and learning contexts

k) The course is designed using a model of delivery that includes thorough planning, monitoring, reviewing and evaluating of course materials and student progress

l) The course provides a range of available navigational choices for students

m) The course treats content differently and at various levels of sophistication depending on the prior knowledge of the learner

n) The course provides appropriate feedback and opportunities for review and self testing

o) The course offers shortcuts for those who are time poor or already competent.

General comments:

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